

Study on the Motivation and Performance of Energy Enterprises' Mergers and Acquisitions under the Background of Dual Carbon-- Taking Tianshan Cement's Merger and Acquisition of Zhonglian Cement as an Example

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Abstract

General Secretary Xi Jinping pointed out in the report of the Twentieth National Congress that realizing carbon peak and carbon neutrality is a major strategic decision made by integrating the domestic and international situations, and a solemn commitment to build a community of human destiny. Based on the background of energy transformation, many energy companies have joined the M&A army for the purpose of improving operation and management level and expanding market share. This project takes the second largest energy-consuming cement industry as the research object, and analyzes the case of Tianshan Cement's merger and acquisition of Zhonglian Cement to further study the impact of M&A and restructuring on the financial performance of energy companies. Based on the background of "double carbon" and theories such as synergy effect theory and green development, the project firstly analyzes the internal and external environment of M&A and restructuring of energy enterprises, and explains the significance of M&A on the strategic restructuring and professional integration of enterprises. Secondly, SWOT analysis is applied to systematically analyze the motivation of Tianshan Cement's green M&A with Zoomlion Cement from the dimensions of external environment and internal conditions. Immediately after that, for the case of Tianshan Cement's acquisition of Zhonglian Cement, the event study method and relevant financial indicators are used to examine Tianshan Cement's financial performance before and after the merger and acquisition; at the same time, the environmental and social performance is used to reflect the non-economic performance, so as to comprehensively judge the effect of the merger and acquisition. Finally, based on the above research, we provide policy recommendations for energy companies to implement M&A and reorganization and effectively improve M&A performance. This project will help enrich the literature on M&A of energy enterprises and provide suggestions for the implementation of scientific and efficient M&A.

Keywords

Bicarbon, corporate mergers and acquisitions, motivational analysis, firm performance.

1. Introduction

General Secretary Xi Jinping pointed out in his report to the Twentieth National Congress that the realization of carbon peaking and carbon neutrality is a major strategic decision made in

the context of integrating the domestic and international situations, and a solemn commitment to building a community of human destiny. At present, in the context of building a beautiful China, China's economic development is gradually moving towards the stage of high-quality development, in which it is necessary to implement the concept of green development and promote the green transformation of the industrial structure and energy structure. The proposal of the "dual carbon" goal has redefined the target path of green and low-carbon transformation and the mission and vision of sustainable development for the energy industry. As an important means of professional integration and effective resource allocation, M&A and restructuring play a pivotal role in the transformation and development of energy enterprises. Numerous large-scale enterprises through M&A and restructuring to integrate resources, eliminate excess productivity, rationalization of industrial structure, so that the resources to the advantage of the concentration of enterprises.

Among many energy industries, cement industry, as a typical traditional high-energy-consuming industry, has become an important means for China's cement industry to realize sustainable development by generating scale effect, eliminating backward production capacity and adjusting product structure through mergers and acquisitions (M&A) and reorganization. Based on the background of "double carbon", this project selects the deep integration of the core enterprises under China National Building Material as the main object of research from many cases of M&A of cement enterprises, and conducts an in-depth study on the motivation of the M&A of TIANSHAN CEMENT and the impact of the performance of TIANSHAN CEMENT before and after the M&A, so as to provide some reference and experience for the M&A and restructuring of other energy enterprises from the green transformation and structural adjustment of the centralized enterprises. The green transformation and structural adjustment of centralized enterprises provide some lessons and experiences for other energy enterprises.

2. Current status and development trend of domestic and international research on corporate mergers and acquisitions

2.1. Literature Related to the Motivation of Corporate Mergers and Acquisitions

Liu Yuhua (2017) stood on the perspective of government intervention, mergers and acquisitions carried out by government-driven enterprises or their managers due to political motivation, from the perspective of promoting the local economy, continuously reducing the industrial rate and trying to maintain social stability, governments at all levels show a strong motivation for mergers and acquisitions by intervening in local state-controlled enterprises under their control, in order to be able to enable these enterprises to reduce the bankruptcy ratio. Tong Yan et al. (2020) believe that the promotion of corporate innovation is the motive of corporate M&A, and the M&A of corporate innovation motive has a significant promotion effect on the innovation output of the main merger party, but this promotion effect needs to be integrated and absorbed before it can be realized, so there is a certain time lag. With global warming, green M&A has become an emerging M&A approach, and Salvi et al. (2018) point out that environmental degradation is one of the main reasons for the growth of green M&A deals. According to Vina Huang and Tianrong Yuan (2020), the evolution of green policies has led to greater legitimacy pressure on companies and increased public participation, which has pushed companies to implement green M&A. Green M&A has become an important tool for corporate sustainability. Especially for the typical "three highs" (high consumption, high emission and high pollution) heavy polluting enterprises, green M&A will be a means for it to gain a rapid first-mover advantage in new strategic areas (Zhang, 2021).

2.2. Literature related to corporate M&A performance

On the issue of M&A performance, domestic and foreign scholars, however, have not reached a consensus. Some scholars believe that M&A has a positive impact on enterprises: after launching a study on M&A performance in high-tech industry, Hagedoorn and Duysters (2018) found that M&A enterprises have better economic performance due to synergistic effects generated by economies of scale and economies of scope. Congcong Gou (2019) empirically analyzed the performance data of listed companies in the retail industry in China from 2000-2017 and concluded that mergers and acquisitions have a significant impact on improving the performance of the company, especially horizontal mergers and acquisitions are more significant in improving the performance of enterprises. Xu Wenjing (2022) concluded that acquirer executives with identity with the target firm will significantly enhance the M&A performance; the narrower the scope of identity, the more significant the enhancement of identity on M&A performance. The long-term effects of M&A frequency and M&A scale on M&A performance of technology-acquiring firms are positive; the better the legal environment is, the more conducive to improving firms' M&A performance under the same technology-acquiring M&A frequency and M&A scale (Chiang, Zhixiong, and Wang, Yulu, 2022).

There are also scholars who believe that corporate mergers and acquisitions will bring negative impacts: foreign scholars Agrawal et al. (1992) through the analysis of more than 1100 cases of mergers and acquisitions, concluded that: cross-border acquisitions do not have a positive impact on the performance of the company, and on the contrary in the process of mergers and acquisitions, due to the company invested in a large number of manpower, material resources, resulting in a decline in the performance of the company after the merger and acquisition, and shareholders also suffered a loss. losses. Liu Huifang (2017) used the regression method to test, by analyzing the cases of cross-border mergers and acquisitions carried out by domestic enterprises from 2010 to 2015, and found that the competitive advantages and disadvantages of both sides, the differences in the system, and the financial risk of mergers and acquisitions in this process will have a negative impact on the operating performance of the merger and acquisition party.

2.3. Review of the study

With regard to the research on the motives of corporate M&A behavior, the views of scholars at home and abroad are basically the same. There are two popular concepts in the market, which are principal-agent and synergy effect theories, and other M&A motivation theories are also related to this. And the motives about green M&A are mostly to acquire green technology, carry out green innovation, and promote the green development of the industry. However, in the existing case study literature, scholars at home and abroad have different opinions on the evaluation standard and impact of corporate M&A performance, and the existing evaluation indexes are rarely combined with the characteristics of the industry development, and the judgment angle is relatively fixed and patterned. Based on this, this project takes the "dual-carbon" background as the research perspective, and analyzes the motivation and performance of M&A and restructuring of energy enterprises, hoping to enrich the literature on M&A and effective resource allocation, and at the same time, provide support for the country to achieve the dual-carbon goal, and provide references for other enterprises to carry out green M&A.

3. Tianshan Cement acquires Zoomlion Cement

3.1. Case review

On July 25, 2020, TIANSHAN issued a suspension announcement and indicated that it was planning matters relating to the major asset reorganization, through which TIANSHAN would incorporate the huge high-quality cement segment business of CNBM into itself; in August of

the same year, TIANSHAN again issued relevant announcements, which announced the pre-proposal of the M&A and reorganization connected transaction as well as the specific plan of the M&A and reorganization; on March 2, 2021, the TIANSHAN shares published 49 announcements consecutively, deciding to exchange the subject assets by issuing shares and paying cash, and at the same time raising relevant funds; in September 2021, TIANSHAN shares received the approval of the China Securities Regulatory Commission (CSRC) for this M&A and reorganization transaction; in November 2021, new shares issued for the purpose of purchasing the assets were issued on the Shenzhen Stock Exchange; in January 2022, TIANSHAN shares raised matching funds by privately issuing shares to 16 issuing targets. The matching funds raised from the issuance of shares arrived and the corresponding shares were issued in February 2022 on the Shenzhen Stock Exchange. The purpose of the merger and reorganization of TIANSHAN shares has also been completed with the arrival of the proceeds of this fund-raising, and the related transaction matters continue to progress.

3.2. Motivational profiling

3.2.1. Internal causes

Enhancement of enterprise competitiveness

Cement is an important basic raw material for the construction category, which can play a non-negligible role in the development of national economy. Cement products are highly regionalized and fully marketable. As cement products are characterized by large transportation volume of raw materials and products, high freight cost and limited shelf life of products, cement has certain geographical limitations in the scope of sales, that is to say, the cement industry is an industry with a sales radius, and the sales of its products are constrained by the distance. Scientifically speaking, for ordinary cement, the reasonable transportation radius is about 150-200 kilometers for transportation by car, 300-500 kilometers for transportation by railroad, and by waterway, the reasonable transportation radius is higher, about 600 kilometers or more; and for special cement, due to the technical difficulties of its production and the technical performance to be higher, and the added value of its products, the selling price is also high, the reasonable transportation radius is relatively speaking higher than that of the cement industry. The transportation radius is relatively higher than that of ordinary cement. It is this kind of sales of geographical restrictions lead to China's domestic cement industry, regional concentration is increasing. The more obvious geographical nature of product sales has directly formed the market pattern of increasing regional concentration in the domestic cement industry. According to the development law of the international cement industry, when the leading cement enterprises in the regional market market share of more than 60%, can play a stabilizing effect on regional prices.

In addition, mergers and acquisitions can also enable enterprises to rapidly expand the scale of operations, so that enterprises can not only reduce the unit cost of products, enhance the advantages of economies of scale, but also make the advantages of the enterprise's production factors complement each other, so that the enterprise in the regional scope of the enterprise monopoly power to enhance the enterprise, in the price of a certain degree of decision-making, and more highlight the competitive advantages of the enterprise.

Pursuing synergies

At present, China's cement enterprises are characterized by: generally low scale, and the distribution is extremely decentralized, the result is that the cement industry has a low degree of concentration, and does not have the core competitiveness. This determines the mergers and acquisitions is cement enterprises to enhance the overall core competitiveness of the inevitable means, mergers and acquisitions can bring synergistic effect to the enterprise.

The first is the synergy of resource advantages. Cement industry is both resource-intensive and energy-consuming, and having resource advantages is fundamental to the survival of a cement

enterprise. For cement manufacturers, it can basically be described as "whoever has the resources has the world". Whether the supply of raw materials is sufficient or not, and whether the channels are smooth or not has become the key to the future development of cement enterprises. One of the main purposes of cement companies' external expansion is to compete for advantageous resources, such as limestone, the raw material for cement. In order to obtain the required resources, enterprises can acquire local enterprises or form strategic alliances with local enterprises to enter the local market, and then occupy or share the advantages of local market resources with local enterprises, coupled with the support of the local government's preferential investment policies, enterprises can obtain outstanding competitive advantages to compete with other enterprises.

The second is management and financial synergy. Enterprises that implement mergers and acquisitions are usually those in which advantageous enterprises drive local enterprises with local characteristics to implement expansion under their efficient management systems. Due to the role of economies of scale, the enterprise's main product costs in a considerable range of sharing, so that the enterprise's unit costs can be reduced to a minimum, management, technology, information and other resources can also be shared among the units, but also reduce the training and learning brought about by the cost of management, and efficient management tools and the adoption of new technologies, but also enhance the operational efficiency of the enterprise, thus creating more benefits to the enterprise, in order to continuously ensure the leading position of the enterprise, this is the so-called management synergy effect; and financial synergy effect is the merger and acquisition of enterprises through the merged and acquired enterprises where the local government and creditor negotiation, mergers and acquisitions of enterprises can be in the bank to obtain the bank to suspend the interest of pending loans and other aspects of the preferential treatment, and thus get the synergistic effect of the financial aspects.

3.2.2. External causes

National policy driven

For a long time, China's cement industry has been characterized by overcapacity, over-dispersed distribution of enterprises and vicious competition, resulting in low cement prices and low profit margins due to the lack of economies of scale of most enterprises. In order to solve these outstanding problems in China's cement industry, the state encourages the cement industry to carry out industrial consolidation, with the intention of improving industry concentration and making the cement industry develop in a healthy and orderly manner. The main policy measures include: raising the threshold of industry access to inhibit the increase in the number of enterprises in the industry; eliminating backward production capacity and promoting new technologies to eliminate the backward enterprises in the industry; and facilitating the success of mergers and acquisitions through direct administrative intervention by the government in the mergers and acquisitions of enterprises and the parties involved. The cement industry has high policy barriers, and in recent years, a series of relevant policies issued by the state has played a great role in promoting the integration of China's cement industry, and is the driving force for industry integration.

Enterprise green development drive

In recent years, in the face of the increasingly severe ecological and environmental situation, strengthening the construction of ecological civilization has become a basic national policy. The report of the twentieth Party Congress proposes that there is a need at present to build a green, low-carbon and circular development aimed at

A contemporary economic system of sustainable development that focuses on solving the problem of environmental pollution is thus essential for the promotion of corporate social responsibility.

The attention of the industry's low-carbon environmental protection and sustainable development of green investment has also increased invisibly, and has become a capital market. Green investment includes green mergers and acquisitions and environmental investments. Green investment includes green mergers and acquisitions (M&A) and environmental protection investment (EPI), compared to environmental protection investment (EPI).

While capital is time-consuming and the return on investment is difficult to determine, the implementation of green M&A is more efficient and able to

Promote their own greening by acquiring the green production technology and green resources of the other company in a shorter period of time.

Transformation and upgrading.

3.3. Performance evaluation

3.3.1. Financial performance

Research design

Defining events

TIANSHAN shares intends to use the issuance of shares and payment of cash to purchase assets such as 100% equity interest in Zhonglian Cement, 99.9274% equity interest in Nanfang Cement, 95.716 6% equity interest in Southwest Cement, and 100% equity interest in Sinoma Cement from its parent company and other counterparties, and this transaction will constitute a major asset reorganization, and this paper will define the research event as TIANSHAN's merger and acquisition and reorganization.

Determination of event days and event study windows

a.Determination of the date of the event

The event date refers to the point in time when the capital market receives information about the event, rather than the point in time when the event actually occurs. On July 24, 2020, Tianshan shares made its first M&A and restructuring announcement, intending to acquire the assets of its parent company's cement segment. Since the suspension of trading on July 27 to the official resumption of trading on August 10 after three consecutive days of suspension, the share price hit a new record high, after which the overall downward trend. After six months, Tianshan shares in the evening of March 2, 2021 again issued mergers and acquisitions restructuring announcement, disclosure of the formal restructuring program, the next day the stock price to stop opening, just the rate of increase and the price is not more than the last time, and after that is still a high open low. It can be seen that both announcements have a certain impact on stock price volatility. Therefore, this paper selects the day of the first announcement of M&A restructuring and the day of the formal disclosure of the draft M&A restructuring of Tianshan shares as the event day.

b.Determining the event study window.

The event study window includes the event window and the estimation window. Among them, the event window is used to test whether the stock price has abnormal reaction to the event or not, this paper chooses 10 trading days before and after the event day as the event window, i.e. [-10, +10]. The estimation window is used to estimate the expected return, and the 100 trading days before the event window are chosen as the estimation window, i.e. [-110, -11]. If the event window or the estimation window contains non-trading days or trading days, the trading data cannot be obtained, then it will be postponed to the next trading day, as shown in Table 1.

Table 1: Event days and event study windows

Event day (t=0)	Event Window [-10,+10]	Estimated window [-110,-11]
2020-07-24	2020-07-10 to 2020-08-21	2020-02-13 to 2020-07-09
2021-03-02	2021-02-09 to 2021-03-16	2020-09-11 to 2021-02-08

Selection of models

There are generally four different methods for calculating the expected rate of return, and in this paper we choose the most commonly used market model with the following formula.

$$R_{it}=a_i+b_i\times R_{mt}+e_{it} \quad (1)$$

Where R_{it} is the real return of stock i on trading day t ; R_{mt} is the real return of the market portfolio on trading day t ; a_i denotes the intercept term; b_i denotes the degree of sensitivity of individual stock returns to market returns, i.e., the systematic risk of the stock; and e_{it} is the random perturbation term. The individual stock returns and market returns used in this paper are obtained from the CSMAR database.

Calculation of excess returns and cumulative excess returns

Excess Return (Abnormal Return, AR), AR_t is the difference between the actual return and the expected return of stock i on trading day t , calculated as follows.

$$AR_t = R_{it} - E(R_{it}) \quad (2)$$

Where $E(R_{it})$ is the expected return on stock i on trading day t , which is the expected return that could have been earned if the event had not occurred.

Cumulative Abnormal Return (CAR), CAR_t is the sum of the excess returns of stock i for each trading day during the event window, calculated as follows.

$$CAR_t = S(t_1, t_2) AR_{i,t} \quad (3)$$

where $S(t_1, t_2)$ denotes the summation of the excess returns over the event window (t_1, t_2) .

Tests of Significance

In order to more accurately reflect whether the occurrence of the event of merger and acquisition and reorganization of Tianshan shares has had an impact on the volatility of the stock price, this paper conducts a t-test on the cumulative excess return and puts forward the original hypothesis $H_0: CAR=0$, the construction of the t-test statistic with the following formula.

$$t_{CAR} = (CAR-0)/s(CAR) \sim t(t_1, t_2) \quad (4)$$

where s is the standard deviation of the cumulative excess return.

Empirical analysis

The day of the first announcement of the M&A reorganization as the event date

As can be seen in Figure 1, prior to the first M&A and reorganization announcement of Tianshan, the overall return is positive and the stock price fluctuation is relatively flat, although the cumulative excess return tends to decrease. On the event day, although the excess return is negative and the announcement seems to send a negative signal on the surface, the excess return stays high at 10% for three consecutive days and the cumulative excess return reaches a peak of 34.2% within the event window [1, 3], which indicates that Tianshan's M&A restructuring has been recognized by the market and the announcement is a positive news. One possible explanation is that this M&A and reorganization plan of TIANSHAN shares fulfills the promise made by its parent company, China National Building Material, on November 13, 2017: to solve the problem of intra-group competition within three years, and to enhance the core competitiveness of the enterprise group through the integration of its cement subsidiaries, which has just allayed the doubts of investors. However, after three stops after the resumption of trading, the excess return declined sharply, and even though it rose slightly thereafter, it eventually fell back to the level on the day of the event. Overall, the cumulative excess return performs better throughout the event window, and is consistently positive except for a negative value at $t = -10$, which shows that the announcement has a positive stock price effect. From Table 2, CAR_1 passes the t-test, indicating that there is a significant stock price effect of the first M&A and reorganization announcement of Tianshan.

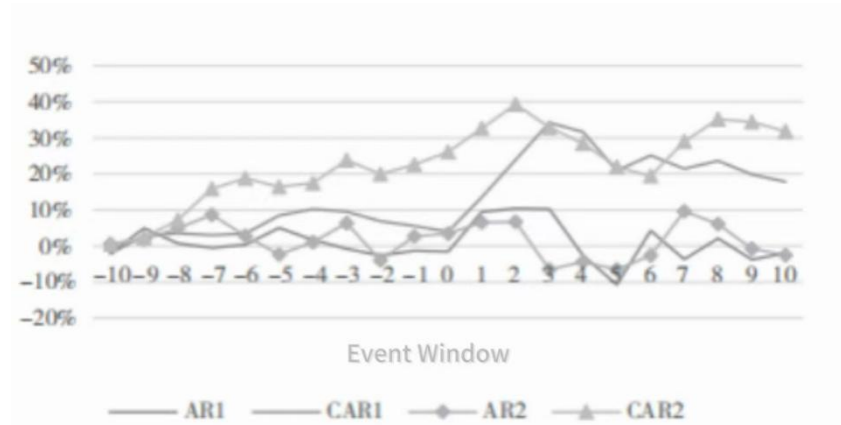


Figure 1: Excess Returns and Cumulative Excess Returns on Two Event Days for Tianshan Shares

Table 2: Results of one-sample t-test for CAR

Test value = 0			
Cumulative excess return	t-value	Significance (bilateral)	mean value difference
CAR ₁	5.997	0.000	0.137091
CAR ₂	9.826	0.000	0.226853

① The day of formal disclosure of the draft M&A reorganization as the event date

As can be seen in Figure 1, during the event window [-10, -1], compared to the first M&A and reorganization announcements, the stock price fluctuates less steadily but spends most of the time in an upward channel, with excess returns and cumulative

The excess yields have all moved and grown better. On the day of the event, the excess yield was positive and slightly higher than the previous day, and the subsequent two days also had a good performance, an average of more than 6.5%, just not as strong as the first announcement when the reaction was strong, and the stock price went straight up. This may be because the reorganization is only the beginning of the parent company's cement assets integration, mergers and acquisitions program does not involve the group's other two listed companies Ningxia Building Materials and Qilianshan Cement, and the problem of interbank competition has not yet been completely resolved, so less than the investor's expectations. Afterwards, the excess return falls sharply and is negative for four consecutive days until t=7, when it bounces back to positive and rises to a peak of 9.6%, however, it still keeps falling to negative levels. Finally, the cumulative excess return is almost the same as the first day after the official disclosure of the draft M&A reorganization, and the stock price retraces to the normal level in a short period of time. According to Table 2, CAR2 passes the t-test, indicating that there is also a significant announcement effect of the formal disclosure of the draft M&A reorganization of Tianshan shares.

Conclusion

First, Tianshan's M&A and reorganization events significantly improved the company's short-term performance. The two successive restructuring announcements made by Tianshan generated significantly positive cumulative excess returns during the event window, suggesting that Tianshan's peer-to-peer M&A event sent a positive signal to the market and was favored by investors.

Second, the formal disclosure of the restructuring draft gained better market reaction than the first M&A restructuring announcement. As the formal restructuring proposal contains more

information, the substantial M&A content strengthens investors' expectation that the M&A restructuring of Tianshan shares will enhance the share price and bring more excess returns for the company.

Third, the stock market overreacted to both of Tianshan's merger and reorganization announcements. Regardless of which announcement was used as the event date, high excess returns were achieved two to three trading days after the announcement was made, but the cumulative excess returns on the last trading day of the event window essentially fell back to the level of the first trading day after the announcement date.

3.3.2. Non-financial performance

Based on the synergy effect theory analysis, on the one hand, TIANSHAN CEMENT implements green merger and acquisition of a larger scale, can bring scale benefits, to a certain extent, reduce the financing constraints, and then increase the enterprise green environmental protection investment, improve the environmental performance of the enterprise; on the other hand, the merger and acquisition of the two sides of the financial resources complement each other, resulting in financial synergies, TIANSHAN enterprise internal funds are more adequate, it is easier to obtain financial support, which will increase the enterprise's green investment and improve environmental performance.

From the case of Tianshan Cement's merger and acquisition of Zhonglian Cement, we can learn that: green merger and acquisition is an effective measure for heavy polluting enterprises to face the environmental regulation, which can send a good signal to the outside world that the enterprises practice the concept of green and low carbon, indirectly reduce the financing constraints of the enterprises, and help the enterprises to get the government's support and more policy subsidies, which can increase the green investment of the enterprises and help to realize the green and sustainable development and improve enterprise environmental performance. Moreover, the good signals transmitted by the enterprise to the outside world establish the enterprise's green image, indirectly enhance the market credibility of the enterprise's products and customer satisfaction, to a certain extent, enhance the enterprise's surplus sustainability, making green M&A both economic and environmental benefits.

In summary, green M&A behavior not only brings green heterogeneous resources to enterprises, but also enables enterprises to obtain synergistic effects in various aspects, establishes a good image of enterprises' green and low-carbon, and improves the environmental performance of enterprises directly or indirectly to a certain extent.

4. Reach a verdict

The results of the study show that green M&As are green strategies adopted by energy firms motivated by substantive transformation, which can drive firms to engage in substantive green innovation in the long term. Green M&As further incentivize firms to actively invest in green innovation by releasing good signals to society and obtaining relevant government subsidies and tax incentives. In addition, green M&A mainly enhances corporate performance by acquiring and applying green resources. The acquisition of green development resources helps to develop new business areas, reduce operating costs and reduce environmental pollution, thus enabling energy enterprises to realize the unity of economic and environmental benefits. Finally, it should be clear that the implementation of green M&A by energy companies should take into account long-term performance. Judging the impact of green M&A on enterprise performance needs to take into account both short-term and long-term aspects, not only focusing on short-term economic benefits, but also focusing on improving the future development potential of enterprises.

The findings of this paper not only theoretically enrich the research on the economic effects of green M&A, but also practically provide insights for the government to formulate relevant policies and for enterprises to adopt green strategic decisions.

First, the government should encourage energy enterprises to carry out green mergers and acquisitions, and improve relevant support measures to stimulate the enthusiasm of enterprises for green innovation. When screening support objects or projects, the government should break the traditional subsidy model, establish a differentiated support model oriented to innovation output, increase the preliminary support for substantive green innovation projects, and at the same time, screen the innovation results of enterprises in the actual subsidies, and strictly support the standards to prevent the possible existence of strategic behavior.

Secondly, the government should guide state-owned enterprises to actively carry out substantive green innovation, while effectively supporting private enterprises and protecting their green innovation achievements; it should further promote enterprises to take the initiative in environmental governance, so that they can still take the initiative to realize green transformation by adjusting their environmental protection strategies in the case of weak environmental law enforcement; and it should improve the environmental performance assessment mechanism to guide local officials to pay attention to environmental governance, thus enhancing the overall green development level of the region and creating an atmosphere for enterprises to create a favorable environment for green transformation. The environmental performance assessment mechanism should be improved to guide local officials to pay attention to environmental governance, so as to enhance the overall level of green development in the region and create a favorable atmosphere for green transformation of enterprises.

Thirdly, energy companies should accelerate the pace of green transformation and choose appropriate green transformation strategies. In the face of stringent environmental regulatory requirements, energy companies should not only focus on immediate benefits, but also make long-term strategic plans. When choosing the way of green transformation, these enterprises should realize the advantages of green mergers and acquisitions, and the subject enterprise complement each other, coordinate with each other, and actively lead the enterprise towards a more recognized green direction. At the same time, energy companies should correct their green motives and abandon short-sighted behavior. Energy companies should take green M&A as an important means of upgrading technology and realizing substantive transformation, rather than a tactical tool to divert public opinion and reap other benefits. After green M&A, energy companies should take advantage of M&A to occupy a favorable ecological position for green transformation, accelerate the integration and synergy between the two sides, further increase the output of high-quality green innovation, and walk out of a sustainable green development road.

Fourth, energy companies should emphasize green technological innovation and exploit technological synergies. Green technology innovation plays a mediating role in the positive impact of green M&A on the comprehensive performance of enterprises. In the process of implementing green M&A, enterprises should pay attention to green technology innovation. Based on the case study, we can analyze that knowledge resources are the most important of an enterprise's strategic resources, which are scarce, inimitable and irreplaceable, and can help the enterprise to obtain sustainable competitive advantages. Energy enterprises should seize the technology as the core knowledge resource, combine the internal green technology research and development with the green technology acquired externally, and jointly promote the enterprise's end-of-pipe treatment technology, production technology and environmental protection product research and development technology level, and give full play to the synergistic effect of the technology to improve the possible pollution problems.

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