



The Value Creation Mechanism of ESG: An Empirical Focus on China's Power Sector under the Dual-Carbon Goals

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Abstract. Against the backdrop of China's ambitious Dual-Carbon Goals, the power sector faces immense pressure to decarbonise, making the Environmental, Social, and Governance (ESG) framework a critical strategic tool. This paper investigates the mechanisms through which ESG performance drives firm value and financial performance in China's power sector. First, it explains the research background and shows why the power sector is an important case in the context of low-carbon transition and energy security. Second, it describes the current development of the sector and the growing role of ESG disclosure and governance. Third, it analyses the positive effects of ESG through financing capability, investor confidence, operational efficiency, and long-term strategic resilience. At the same time, the paper identifies three major problems: high transition costs and short-term financial pressure; incomplete ESG disclosure; and greenwashing risks arising from weak implementation capacity. In response, the study makes three recommendations: stronger substantive ESG governance, better ESG disclosure quality, and phased low-carbon transition methods. The study concludes that in China's power industry, strong ESG practices are a major factor in determining corporate value and financial performance. However, the quality of ESG implementation, the veracity of business disclosures, and the strategic balancing of short-term transition costs versus long-term sustainable development goals are all necessary for this value to be realised.

Keywords: ESG, Firm Value, Financial Performance, Electricity Industry, Dual-Carbon Goals

1 Introduction

1.1 Research Background

Climate change mitigation, decarbonisation and the move towards a net-zero economy have become a focal point of the global policy and corporate governance. To respond to such a global requirement, China has established radical national climate objectives and fulfilled its responsibilities within the Paris Agreement. Within this

broad context, China has defined its national climate objectives, which consist of achieving carbon neutrality no later than 2060 and peaking in carbon emissions by 2030. These aims, all of them known as China's "Dual-Carbon Goals", have radically changed the institutional and business conditions of carbon-intensive industries, specifically the power industry [1].

These aims have radically changed the institutional and business environments of carbon-intensive industries, especially in the electricity sector. The power sector has become one of the most important sectors in the low-carbon process in China due to its strong connections with industrial production and national energy security, as well as carbon emissions. Already, China has a national carbon market worth 2,257 large emitters who emit more than 5.1 billion carbon dioxide emissions annually, beginning with the electricity industry [2]. This leads to severe regulation on the power sector, and its achievement of national objectives is reliant on a path of decarbonisation. It suggests that the electricity industry is among the most sensitive to policy intervention in terms of decarbonisation requirements, and it is also a huge emitter.

As per the latest official statistics, the electrical system in China has definitely been transformed. Last year saw clean energy generation, including hydropower, nuclear power, wind power and solar power, generating a total of 3,712.6 billion kilowatt-hours of electricity, an increase by 16.4 per cent a year [3]. Consequently, the value proposition and financial viability of power companies have undergone a fundamental change in that the traditional measures of output and short-term profitability do not apply. In fact, stakeholders, investors and regulators now focus more on how businesses approach risk, governance, environmental issues and long-term sustainability.

With that in mind, ESG has gained popularity as a tool of analysis to explain the relationship between the economic success of businesses and non-financial performance. A good ESG performance is being viewed by power companies as a substitute when it comes to managing a pair-carbon transition, which affects some essential areas in the company. ESG is not merely a matter of corporate visibility and external disclosure for the electricity companies. It has a direct impact on carbon compliance, funding conditions, the credibility of investors, operational performance, and the potential to transform in the long term. The standardisation and institutionalisation of ESG disclosure in China are also observable through the three-year plan of the Shanghai Stock Exchange and the sustainability reports requirements [4,5]. Thus, the investigation of the effects of ESG on the company value and financial performance within the Chinese power sector can also be related to international discussions regarding decarbonisation, sustainable financing, and governance of carbon-intensive industries, as well as national policies.

1.2 Literature Review

An increasing number of studies examine the relationship between the performance of businesses and ESG. Zhao et al. found a strong link between the financial outcomes of stock-listed power-generating firms and ESG outcomes within the Chinese environment [6]. It implies that ESG cannot be regarded as a mere symbolic idea of sustainability, but it can also have an economic utility in the sphere of electricity. More

recent evidence concerning Chinese listed companies states that ESG may improve financial performance, especially when considering carbon-intensive companies [7].

There is also a substantial amount of literature on firm value. As per Li and You, ESG performance plays a significant role in enhancing the worth of companies in the Chinese market, and innovation of business and company reputation represent the major ways through which ESG creates value [8]. On the same line of thought, An et al. find that ESG information sharing could be quite beneficial to business values as it has the potential to release finance-related restrictions [9]. Also, Tang et al. argue that the association between ESG performance and firm value is mediated by investor confidence, implying that ESG influences market valuations both by external expectations of the capital markets and internal management improvements [10].

However, the link between ESG and enterprise value is not always strictly linear. The study done by Shangguan, Shi and Yu indicates that ESG performance and company values in China have an inverted U-shaped relationship [11]. It indicates that the economic impact of ESG depends on the quality of implementation, the financing environment, and the volume of ESG investments. It is particularly important because it affects industries with high asset bases, such as the generation of power, and the transition to clean energy often demands massive capital investment and might even disrupt the profitability in the short term. Moreover, research on China's thermal power companies has shown that market performance and green transformation may be linked via a synergy mechanism; however, the procedure is complex and very sensitive to operational conditions and policy [12].

Overall, past studies provide a useful framework towards understanding the relationship between ESG, firm value and financial performance. Nevertheless, in light of carbon peaking and carbon neutrality targets in the Chinese power sector, industry-specific research should continue to be carried out.

1.3 Research Gap

Still, there exist three major gaps in research. Firstly, much of the available research is based on massive samples of publicly listed businesses that can lower the power of the explanation of their findings in highly regulated, carbon-driven industries such as the electricity industry [7,8,9]. Secondly, relatively few works incorporate both dimensions into an integrated description of how ESG produces economic consequences, whereas most of the existing literature has focused on business value or financial performance alone [9-11]. And thirdly, there is no guarantee that the ESG literature is always sensitive to these institutional variables, even though carbon-market regulations are significantly affecting China's energy policy and disclosure standards, as well as the pressure to switch to a low-carbon economy [2,4,5].

Therefore, in this research, it is analysed how ESG impacts businesses' value and financial performance by various interconnected pathways, including financing facility, investor confidence, operational efficiency and transition risk management, which is specifically applied to the power sector in China. This paper will also try to provide a more industry-oriented and policy-sensitive explanation of the economic dimension of ESG.

1.4 Research Framework

This text has such a structure. The text first provides background information on the objectives of carbon peaking and carbon neutrality in China, reviews the ESG literature, and identifies a gap in research. Secondly, it addresses the shifting nature of China’s electricity industry and the importance of ESG in this sphere. Third, it considers how ESG enhances the value of the firm and financial performance prior to discussing major aspects of implementation and its shortcomings. Finally, the report provides a basis upon which further studies on company strategy and policy implications can be developed.

2 Research Context: The Strategic Imperative and Transition Dynamics of China’s Power Sector

The electricity industry in China can be considered an exemplary case to research the concept of ESG in the face of decarbonisation pressure, as it has all three elements, namely environmental consciousness, social accountability, and intensive capital use. Its representativeness arises out of three interrelated factors: that it is the main objective of national climate policy, a bedrock of the low-carbon energy transition, and a vital testing site of the balance between economic viability and environmental and social goals. It is at the heart of national control over emissions and the first industry included in the national carbon market of China [2].

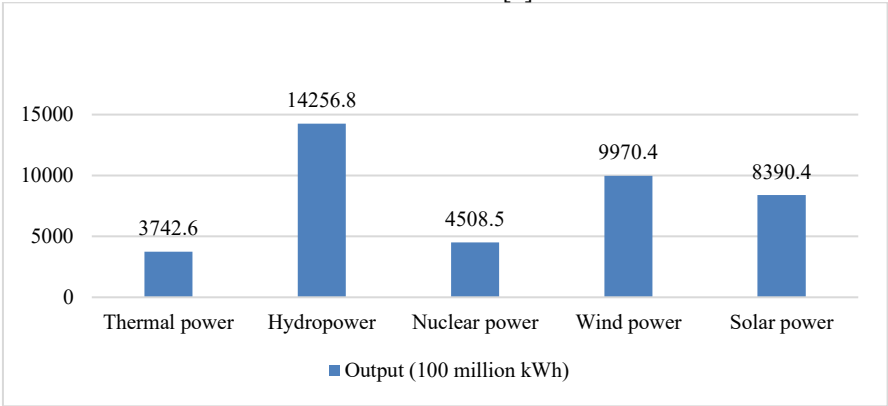


Fig. 1. The Dual Structure of China’s Power Generation: Rapid Growth of Renewables Alongside the Dominance of Thermal Power (2024)

(Source: National Bureau of Statistics of China (2025), Statistical Communiqué of the People’s Republic of China on the 2024 National Economic and Social Development)

The recent expansion of the sector, as represented in Figure 1, can be clearly divided into two segments: the presence of a strong thermal power position and an accelerated increase in renewable energy source capacity. On the other hand, the output of clean energy has been rising fast. The wind and solar generation of electricity rose by

12.5 and 43.6 per cent, respectively, to 9,970.4 billion kWh and 8,390.4 billion kWh, respectively, in 2024. On the contrary, thermal power remained the largest with 63,742.6 billion kWh, indicating that despite the push towards reducing the use of conventional methods, the energy sector was moving towards a low-carbon economy faster [3]. This framework indicates that supply safety and the reduction of carbon are critical concerns in the Chinese power sector. This framework indicates that supply safety and the reduction of carbon are critical concerns in the Chinese power sector. Consequently, the power companies are faced with a particular difficulty because, on the one hand, they need to make the capital-intensive and long-term investment that would radically change the composition of their assets and business models in order to serve the needs of net zero future, and on the other hand, guarantee the smooth and fairly priced supply of energy in the near future.

In ESG terms, the industry has also entered a more high-profile stage of better governance and disclosure. The industry is experiencing a phase of enhanced market interest in sustainability regulations and swift institutionalisation (ESG perspective). Due to the promotion of sustainability-reporting guidelines and action plans by Chinese stock exchanges, ESG is increasingly being used as an external communication and market evaluation tool in listed companies [4,5]. Most power companies have also disclosed in their sustainability, or ESG reports, their carbon-reduction targets, investments in renewable-energy programs, safety of their employees, governance models and stakeholder accountability. However, the extent of strategic integration between companies is still variable.

Due to this reason, there is an ideal environment in the power sector of China to explore the hypothesis that ESG can provide value and financial gain to companies, as well as the conditions under which such benefits become restricted or minimised. It has therefore presented a model setting where a careful analysis of the processes underlying ESG may be conducted in line with specific institutional and operational settings that are conditioned by the presence of the dual-carbon targets.

3 The Dual Facet of ESG: Value-Creation Mechanisms and Implementation Constraints

3.1 Positive Influence Identified

Financing Capabilities and Investor Confidence. Financing can be said to be one of the most important factors through which ESG affects the financial performance of power companies. Specifically, ESG acts as two interconnected subchannels, enhancing access to finance for firms and impact on market perception, i.e., alleviating financing barriers and enhancing investor confidence. It is imperative to note that access to funding matters since power companies require access to vast amounts of long-term capital to purchase assets, undertake technology investments and ensure they comply with environmental regulations. Enhanced ESG performance might assist in getting better financing conditions through enhanced opening as well as lowered information asymmetry, indicating higher levels of governance quality [9]. It

means that it becomes beneficial in reality in the form of decreased debt interest rates, increased opportunities to use green bonds or loans associated with sustainability, or a more extensive range of investors. The study of electric power companies has shown that improved ESG is associated with reduced costs of debt and equity fundraising [13]. ESG may also increase investor confidence. Companies are more likely to be rewarded when they openly demonstrate their climate strategies, governance mechanisms, and the ability to support sustainability throughout an unstable transition process. Hence, the ESG could promote valuation due to the influence on expectations of the external sources within the capital market and changing internal processes [10].

Enhancing the Efficiency of Operations and Management of Risks. The actions in the field of ESG, like energy-saving measures, safety, emission control, and the reform of the government system, will help improve resource use and reduce the potential risk of compliance with regulations in the future in the power company [6,12]. Such changes may help businesses reduce the level of long-term uncertainty and develop strategic stability, especially when stricter environmental limitations are introduced. Besides reducing risk, those efficiency enhancements also reduce the cost of operations (e.g., the result of reduced energy and resource use) and reduce the cost of compliance going forward, which increases profitability. More studies concerning Chinese thermal power companies show that green transformation is related to the concept of performance synergy, which means that lengthy environmental adaptation-economy performance antagonisms are not inevitable [12]. It adds support to the assertion that through fostering a more integrated, futuristic approach to operation, ESG can indirectly contribute positively to financial results.

Improving Long-term Value Creation of Firms during Decarbonization Influence. The third option is long-term value creation. The long-term value creation of power companies has become more contingent on the ability of power companies to adapt to carbon caps, the transition of energy systems, and sustainability projections during the goals of carbon peak and carbon neutrality [1,2]. Increasing the long-term business value can be achieved with the help of ESG as it can enhance the reputation, develop innovation, improve stakeholder confidence, and establish strategic resilience [8,10]. All these elements represent one kind of intangible strategic capital which enhances a competitive licence to operate and flexibility in an uncertain market that is more resilient to shocks and well-placed to benefit from opportunities emerging as a result of the low-carbon transition. In this manner, ESG acts as a connector between the level of governance that currently prevails and what the market is expected to be in the future. The value of this mechanism is especially important in the power industry, where the financial benefits of transition investments are often deferred, and the valuation impact can be realised sooner because of credibility and expected flexibility.

3.2 Problem Identified Analysis

High Transition Costs and Short-Term Financial Distress. The implementation of ESG is costly in the short term for the power companies, but this could be beneficial in the long run. Profits within a shorter period, as well as the amount of capital pressure, can be reduced through the implementation of cleaner technologies, carbon management systems, disclosure capability and governance [11,12]. It can manifest itself as a challenge in terms of balancing short-term shareholder expectations regarding dividends or earnings per share growth with funding the energy transformation of publicly traded power companies. This contradiction is especially evident when dealing with such capital-intensive industries as the production of electric power due to the fact that decarbonisation requires constant capital outlays on the one hand and business entities are obliged to ensure a steady supply on the other. It is also evident why the relation between ESG and business value may not necessarily be linear. Poorly developed or overconcentrated ESG spending has an adverse impact on the financial results in the short term and does not lead to the formation of market benefits [11].

Failure to Provide Complete ESG Disclosure and Evaluation consistency. Yet another important concern is the poor level of ESG evaluation and disclosure. Companies listed on the China stock exchange remain highly varied in terms of data transparency, comparability, and indicator depth, even though China stock exchanges have hastened the process of sustainability report institution [4,5]. The problem becomes much more acute because numerous ESG concerns in the power sector include technical aspects such as emissions accounting, energy efficiency, renewable capacity, and governance implementation. It will be difficult to tell the difference between real success and symbolic reporting when an investor does not have properly standardised ESG metrics [9]. This could actually damage the market discipline that ESG intends to address, whereby a “market of lemons” situation can occur with respect to ESG assessment, where the valuation premium on authentic leaders is reduced, and capital allocation to the most sustainable businesses may not be efficient. Consequently, knowledge asymmetry and irregular disclosure levels could decrease the value surplus associated with ESG.

Threat of Greenwashing and the Potential of Doing Things in Vain. Due to the increased focus on ESG by regulators and investors, some companies might consider highlighting positive sustainability stories instead of fully embedding ESG into business processes and governance [4,11]. The mentioned risk is especially relevant to the heavy emitters that are exposed to an extremely close inspection of the general population and strict regulation. Moreover, not all electricity companies have the same level of internal ESG abilities. Good data systems, professional management, board-level alignment, and the combination with financing and investment decisions represent the keys to an efficient ESG deployment. Under these poor foundations, ESG can still remain a reporting process rather than being the actual determinant of corporate

value and financial performance [6,13]. ESG can, in general, have a high role in determining the value and financial success of firms in the context of carbon peaking and carbon neutrality requirements within the Chinese power sector. Yet its influence varies depending on its effectiveness, authenticity of disclosure, and even whether an organisation is able to strike a balance between transition charges and long-term strategic benefits [11,13].

4 Strategic Implications and Recommendations

4.1 Adopting Phased and Financially-Integrated Transition Strategies

In order to solve the issue of high transition costs and short-term financial stress, electric companies must implement phased transition measures instead of focusing on ESG-related investments in a limited timeframe. The implementation of ESG in the power industry frequently necessitates considerable spending on cleaner technologies, digital monitoring systems, emission control, and disclosure capacity, as well as governance improvements. Such changes can also decrease short-term profitability and add financial pressure if not properly synchronised with corporate cash flow, financing potential, and operating requirements. Hence, a phased transition strategy is crucial to ensure financial stability and long-term sustainability.

The pragmatic answer would be the fragmentation of tasks associated with ESG-related transition into short-term, medium-term, and long-term priorities. Companies need to focus on short-term projects that will rapidly improve the internal management systems, clarity in governance, environmental control, and adherence. Companies can gradually increase the coordination of operations, energy use efficiency, and sustainability-related risk control within the medium term. They will also be able to implement more important structural changes over the long term as per market situations, incentives offered by legislation and affordability of capital, including large-scale moves among assets, and technology improvements. The risk that ESG might turn out to be a short-term liability instead of a long-term catalyst of business value could be reduced through this sequencing.

Similar to the phased implementation approach, it is important to acquire adequate and affordable financing. The power companies must also enhance the connection between financial management and the ESG transition. Companies must actively make use of green finance tools, sustainably related loans, and other policy-driven sources of financing because the changes in the power sector will require the alignment of capital over a long period of time. Transition finance has increasingly been recognised as an important tool for supporting decarbonisation in high-emission sectors, especially when companies cannot rely solely on internal funds to complete low-carbon transformation [14]. Moreover, global energy investment analysis shows that the scale and continuity of energy-transition investment are essential for ensuring a financially viable and strategically effective transformation process [15].

Thus, in this context, the concept of ESG investment should be introduced as an element of the strategic long-term financial plan, not just as another cost.

4.2 Improving ESG Disclosure Quality and Enhancing Reporting Comparability

In order to resolve incomplete coverage of ESG disclosure and poor consistency in evaluation, power companies need to enhance the quality, clarity and comparability of their ESG reporting. At present, certain reports are too broad and vague or do not have sufficient comparison across organisations, which remains a major reason why ESG cannot be valuable. Stakeholders and investors would render the actual market value of ESG information useless if they were incapable of assessing a company's real sustainability performance. Thus, to enhance the efficacy of ESG, it is necessary to enhance the level of disclosure. Finally, the creation of market trust, the ability to determine the correct estimation of the value, and the assurance that flows of money will be directed towards the genuine leaders in the industry in terms of sustainability, all depend on the fact that the best quality comparability of ESG information disclosure.

To start the process, the power companies must offer even more quantitative ESG indicators that are specific to industries. The reports need to be more informative about carbon emissions, energy efficiency, the development of renewable energy, environmental risk management, workplace safety, and sustainability control at the board level, as the power sector is highly sensitive to environmental and governance concerns. Apart from describing the company's initiatives, these indicators must also indicate their connection to long-term development, preparedness for transitions, and operational performance. It would add value to ESG disclosures to investors and make them more relevant to strategic decisions.

Next, organisations are encouraged to improve their ESG data management within. Good disclosure relies on accurate data gathering, specific reporting duties, and regular communication between such departments as finance, operations, environmental management and corporate governance. Although companies may be interested in improving the quality of their disclosure, external reporting cannot be finalised unless the ESG-related information is scattered or poorly tracked. Consequently, companies need to develop more effective review processes before publication and better-structured internal ESG reporting processes.

Moreover, sector-oriented disclosure requirements ought to be further developed. The comparability and ambiguity can be increased with more specific reporting requirements, as the electricity sector is different in a significant way from most other industries. Recent OECD research indicates that more structured disclosure systems related to sustainability and higher board accountability may help to increase the quality and consistency of company reporting practices throughout Asia [16]. Better firm-level reporting should help to improve the quality of disclosures in the electricity industry, but it also requires more comparable reporting frameworks and clearer governance goals.

4.3 Strengthening Substantive ESG Governance to Mitigate Greenwashing Risks

To mitigate the issue of greenwashing and poor implementation capacity, power companies need to enhance the substantive nature of ESG governance and not use ESG as a mere symbolic reporting activity. There are some organisations where ESG is not seen as a central concern of governance, but mostly as an external communications problem. With these circumstances in place, it is possible that businesses will be able to present positive sustainability stories in their reports without having to make substantive changes to their investments and decision-making processes, operations and management policies. This could lead to the improvement of ESG in line with no economic impact being attained.

An optimal approach would be to incorporate ESG in the corporate governance. Initially, the management and board ought to place more focus on ESG. Issues related to ESG need to be included within strategic planning, risk management, major investments and long-term performance considerations, but not be the responsibility of reporting or public relations offices alone. According to OECD research on board responsibility and sustainability-related disclosure, stronger board oversight is important for improving the credibility and substance of corporate sustainability practices [16]. It means that ESG has to become part of the governance of the company, not its presentation alone.

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Next, companies ought to improve their internal ESG implementation ability. To manage ESG successfully, professional knowledge, reliable environmental information systems, the interaction between departments, and clear accountability processes are required. Unless companies possess sufficient technical and managerial ability, ESG aims and objectives will have a tendency to be nominal and hard to implement. Hence, to enhance the quality of implementation, organisations need to invest more in organisation coordination, manager systems and ESG training.

Thirdly, to make greenwashing less attractive, there needs to be more emphasis on the reinforcement of external monitoring and validation measures. Strict assurances or verification measures, transparency in disclosure requirements, and severe consequences of false reporting can enhance the accuracy of ESG data. According to new empirical evidence based on Chinese experience, ESG certification may play an instrumental role in eliminating the practice of business greenwashing[17]. The power sector, as a sector with high levels of public trust, policy pressure, and social responsibility, requires the substantive nature of ESG governance, which will help to change the situation where ESG serves only as a symbolic branding but does not become a real motivator of company value and business performance.

5 Conclusion

5.1 Key Findings

The research indicates that the dual role of ESG could be perceived as a value generator and an element of strategic conflict among companies in the Chinese electric power industry due to dual-carbon goals. It analysed the role of ESG in driving firm value and financial performance of the Chinese power sector with carbon peaking and carbon neutrality objectives. Based on the analysis, it was found that there are several notable channels through which ESG may promote positive economic implications. To begin with, better performance in ESG will facilitate improved financing capacity and enhance investor confidence, enabling power companies to access capital on more favourable terms. Secondly, ESG may promote operational efficiency and risk management by enhancing control of the environment, higher levels of governance, and enhanced internal coordination. Thirdly, ESG may enhance the long-term value of firms by enhancing corporate reputation, resilience and adaptability to decarbonisation pressures. Nevertheless, it is important to point out that the achievement of such positive impacts does not happen automatically.

Nevertheless, the paper established that the impact of ESG does not necessarily need to be positive in every situation. The high costs of transition can put a strain on finances in the short term, especially when it comes to a capital-intensive industry such as power generation. Moreover, the usefulness of ESG data to investors and other stakeholders is also reduced because of restricted ESG reportability and a lack of sufficient comparability. Moreover, ESG might not be translated into a real business value owing to the risks of greenwashing and the inability to implement effectively. In order to counteract these issues, the paper offered the following three recommendations: implementing phased low-carbon transition policies, enhancing the quality and comparability of ESG disclosure and enhancing substantive ESG governance.

5.2 Research Significance

The paper is both practical, business-oriented, and socially relevant. In practice, it is useful in explaining how ESG could serve as a disclosure model as well as a strategy in enhancing the state of funds, operation process and long-term value creation of any enterprise operating in the power sector. Commercially speaking, the research provides more insight into the way that power companies can control financial performance, energy security, and low-carbon transition under high market and political pressures. Socially speaking, the research underlines the overarching importance of ESG in promoting the establishment of cleaner energy, stronger governance, and more credible sustainable practices within an industry that is closely associated with the well-being of society and the overall prosperity of countries. The study adds to the knowledge regarding the reasons why ESG matters in the reformulation of carbon-intensive industries.

5.3 Limitations and Future Studies

The present paper has a number of limitations as well. The first one is that the study is based more on secondary sources of information (policy documents and literature available at the moment), instead of primary data collected by the researcher directly with companies, investors, or industrial professionals. This explains why the paper provides a conceptual and literature-based explanation, but does not carry out any actual empirical research to confirm the indicated correlations. Secondly, the article takes into consideration China's power sector as a typical case, thus making the discussed issue more relevant and specific, but it can be a factor that decreases its ability to generalise the results to other areas of industry or regions. Thirdly, even though the paper outlines various crucial channels via which ESG influences the value of a company and the financial performance, the intensity of these channels could vary depending on the nature of power companies.

Further research on this topic could be done by future studies through gathering primary data on the topic using surveys, interviews or case studies. In order to explore the working of ESG strategies within different power industry subsectors or across different national backgrounds, researchers can also use panel data or comparative analysis. Such future studies would provide an enhanced understanding of the relationship between business economic performance, decarbonisation, and ESG.

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