Research in Economics and Management
ISSN 2470-4407 (Print) ISSN 2470-4393 (Online)
Vol. 8, No. 3, 2023
www.scholink.org/ojs/index.php/rem

Original Paper

A Study on the Low-Carbon Transformation Path of Sinopec Group Based on ESG Principles

Zisheng Tang[1]

[1] School of Management, University of Shanghai for Science and Technology, Shanghai, China

Received: June 20, 2023 Accepted: July 11, 2023 Online Published: July 30, 2023

doi:10.22158/rem.v8n3p62 URL: http://dx.doi.org/10.22158/rem.v8n3p62

Abstract

This study examines the low-carbon transformation path of the petrochemical industry based on Environmental, Social, and Governance (ESG) principles, taking China Petrochemical Corporation (Sinopec Group) as a case study. The research first analyzes the year-on-year carbon emissions of the petrochemical industry. Subsequently, addressing the deficiencies in Sinopec Group's low-carbon transformation path, a series of recommendations are proposed: in terms of information disclosure, the study advocates for improvements in ESG reporting and transparency to enhance corporate governance and social impact. In the strategic aspect, the research suggests that Sinopec Group actively promotes sustainable procurement and green supply chain development, collaborating with partners to drive low-carbon transformation. This study aims to identify shortcomings and provide recommendations for the current low-carbon transformation path of China Petrochemical Corporation, serving as a reference for Sinopec Group and other enterprises within the industry.

Keywords

environmental, social and governance (ESG), Sinopec Group, low-carbon transformation path

1. Introduction

In the face of increasingly urgent global environmental challenges and the necessity to mitigate climate change, the Environmental, Social, and Governance (ESG) principles have gained widespread recognition as a crucial framework for sustainable business practices. As one of China's leading energy and chemical enterprises, Sinopec Group plays a significant role in the national industrial landscape. Recognizing the urgency to transition to a low-carbon economy, Sinopec Group has embarked on a transformative journey, anchored in ESG principles, seeking operations aligned with environmental protection and pursuing sustainable development.

This study aims to delve into the low-carbon transformation path adopted by Sinopec Group, based on the fundamental principles of ESG. Through examining the company's environmental impact, social responsibility, and corporate governance practices, we explore strategic measures that can be employed to promote sustainable and environmentally friendly growth.

By conducting a comprehensive review of relevant literature and an in-depth analysis of Sinopec Group's ESG performance, our objective is to elucidate the deficiencies and challenges in the low-carbon transformation process. Integrating ESG principles into the core strategy of an organization implies not only pursuing economic prosperity but also assuming responsibilities for environmental protection, social welfare, and ethical governance.

2. China's Petrochemical Industry's Decarbonization Development Situation

As one of the world's largest greenhouse gas emitters, China has been actively addressing climate change and implementing a series of significant carbon emission policies and measures. Since the introduction of the "dual carbon" target, the petrochemical industry, which was once labeled as high energy-consuming and high emission, has drawn considerable attention to its decarbonization journey. In 2013, China released the "Twelfth Five-Year Plan for Climate Change," which set specific goals and policies for emission reduction and climate adaptation during the period from 2011 to 2015. This plan covered multiple sectors, including energy, transportation, construction, agriculture, and more. Its implementation has driven China to achieve significant results in emission reduction and climate change mitigation. The following year, China's carbon emissions were reduced by 131 million tons compared to 2013, reversing the rapid growth trend in carbon dioxide emissions since the country became a signatory to the United Nations Framework Convention on Climate Change in 1992. Subsequently, in 2015, 2017, 2018, and 2020, China successively released a series of plans, further emphasizing the importance of peaking carbon emissions and achieving carbon neutrality. These plans put forward more specific measures and pathways toward these goals.

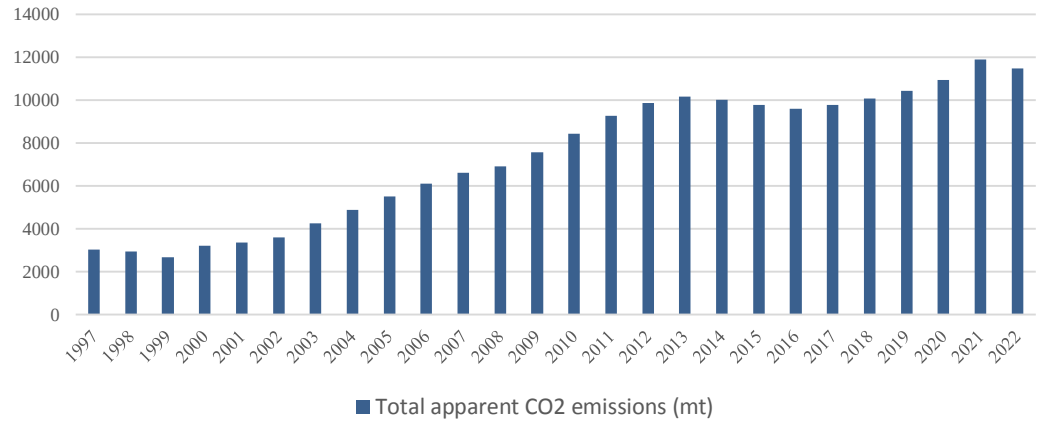

Figure 1. China's Carbon Emissions over the Years

Reference: The author compiled the information based on publicly available data

Traditional oil and gas companies are collectively focusing on low-carbon transformation, optimizing energy utilization structure, increasing electrification levels, accelerating energy-saving and emission reduction efforts, and achieving green and low-carbon development. To objectively reflect the implementation of energy-saving and emission-reduction policies in the petrochemical industry, this study evaluates the emission reduction effects based on carbon emissions from various energy sectors. The analyzed data mainly comes from the "China's Apparent Carbon Emission Inventory" from 1997 to 2019 and the IEA (International Energy Agency) carbon emission data for the petrochemical industry from 2000 to 2022. This study collected carbon emission data for three types of energy and the cement industry since 1997. According to the statistics, the carbon emissions from the energy sector exhibit the following trends from 1997 to 2022.

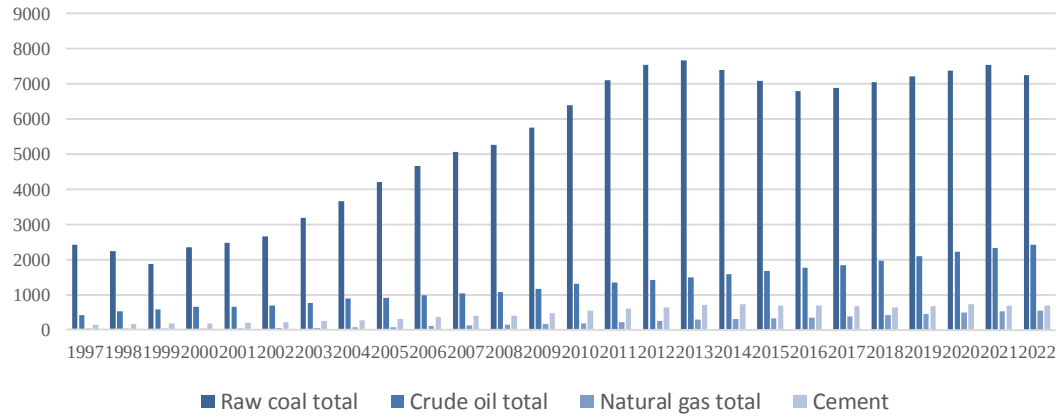

Figure 2. China's Energy Industry'S Carbon Emissions over the Years

Reference: The author compiled the information based on publicly available data.

On one hand, the coal industry, as the primary energy sector in China, accounts for approximately 70% of the country's total carbon emissions, making its carbon emission trends closely aligned with China's overall carbon emission trends. On the other hand, carbon emissions from the petrochemical industry have been steadily increasing. The entire petrochemical sector contributes to around 20% of China's total carbon emissions, including emissions from raw materials, energy consumption, and production processes. While the petrochemical industry's total carbon emissions may be lower compared to industries like coal, its carbon intensity per unit of GDP is higher, and the carbon emission structure is more complex.

The petroleum industry has an extensive industrial chain, ranging from upstream activities such as oil and gas exploration and petroleum extraction to midstream operations including storage and refining, and finally downstream petrochemical processes. The downstream petrochemical industry also has a complete value chain, encompassing basic chemical materials, intermediate materials like synthetic resins and rubber, and finally, end products such as plastic and rubber goods. Carbon emissions in the petrochemical industry mainly originate from the direct combustion of fossil fuels, industrial processes, indirect emissions caused by the purchase of electricity and heat, and emissions throughout the supply chain.

Due to the complexity and interconnectedness of the industry chain, the petrochemical industry faces unique challenges in integrating into the carbon market, such as allocation of quotas, accounting methods, and calculation factors, which are comparatively more difficult than other industries. This implies that, apart from the need for a unified and improved industry-standard system, petrochemical enterprises themselves face challenges in terms of awareness, management, and technological aspects.

3. The Low-Carbon Transformation Path of China's Petrochemical Industry Based on ESG Principles

In recent years, Sinopec Group has taken a series of actions in the green and low-carbon initiatives. In April 2018, the company announced the initiation of the "Green Enterprise Action Plan," which includes specific paths as follows:

3.1 Investment in New Energy Projects

Sinopec Group has made significant investments in the renewable energy sector, particularly in natural gas projects. The "Green Enterprise Action Plan" sets a target for the proportion of low-carbon energy production to exceed 50% within six years. By 2023, the company aims to increase the capacity of conventional natural gas, shale gas, and coal-bed methane, and promote the "Gasification of the Yangtze River Economic Belt" initiative, achieving a natural gas capacity of over 40 billion cubic meters per year, accounting for more than 50% of Sinopec Group's low-carbon energy production. These investments aim to increase the capacity of new energy sources, reduce dependence on traditional fossil fuels, and promote sustainable energy development, thereby increasing the proportion of new energy sources in the energy structure.

3.2 Promoting the Development of the Hydrogen Energy Industry

Hydrogen energy is considered one of the potential future clean energy sources, as it can be produced through water electrolysis to generate green hydrogen, replacing traditional energy sources. Sinopec Group participates in the development of the hydrogen energy industry, including investments and cooperation in hydrogen fuel and hydrogen energy infrastructure. In Guangdong province, Sinopec has already built six integrated oil-electric stations and 22 LNG-integrated oil and gas stations. Further plans include constructing three oil-hydrogen stations in Foshan and Yunfu. Moreover, Sinopec has signed a cooperation memorandum with Air Liquide Group from France to explore enhanced collaboration in the hydrogen energy field. Additionally, Sinopec plans to establish a hydrogen energy company committed to hydrogen technology research and infrastructure network construction, collaborating with leading international hydrogen energy enterprises to create a hydrogen energy industrial chain and an ecological circle of the hydrogen economy, jointly promoting the overall solution of hydrogen energy and fuel cell vehicles in China. By driving the development of the hydrogen energy industry, Sinopec Group plays an active role in achieving energy structure transformation and carbon reduction.

3.3 Fulfilling Social Responsibilities

In 2022, Sinopec Group officially released the "HSE Management System Manual," and each enterprise published a corporate version of the HSE (Health, Safety, Environment) management system manual based on its own production and operational characteristics. At the same time, the HSE Committee's environmental protection sub-committee optimized environmental monitoring indicators, and these indicators are monitored, tracked, analyzed, and improved on a monthly basis. Furthermore, Sinopec Group has established a special ecological and environmental protection inspection mechanism, appointing environmental protection inspectors to conduct inspections in 30 oil and gas fields, refining and chemical enterprises, and sales units. The inspections aim to identify weaknesses in environmental management, propose comprehensive solutions, and further enhance the awareness and capabilities of all employees in ecological and environmental protection work.

3.4 Adjusting the Corporate Governance Structure

Sinopec Group has established a Sustainable Development Committee under its Board of Directors, which improves the top-level design of ESG (Environmental, Social, and Governance) elements, ensuring that economic, environmental, and social factors are fully integrated into the company's decision-making process, providing strong support for the company's sustainable development. The company's governance structure is outlined as follows:

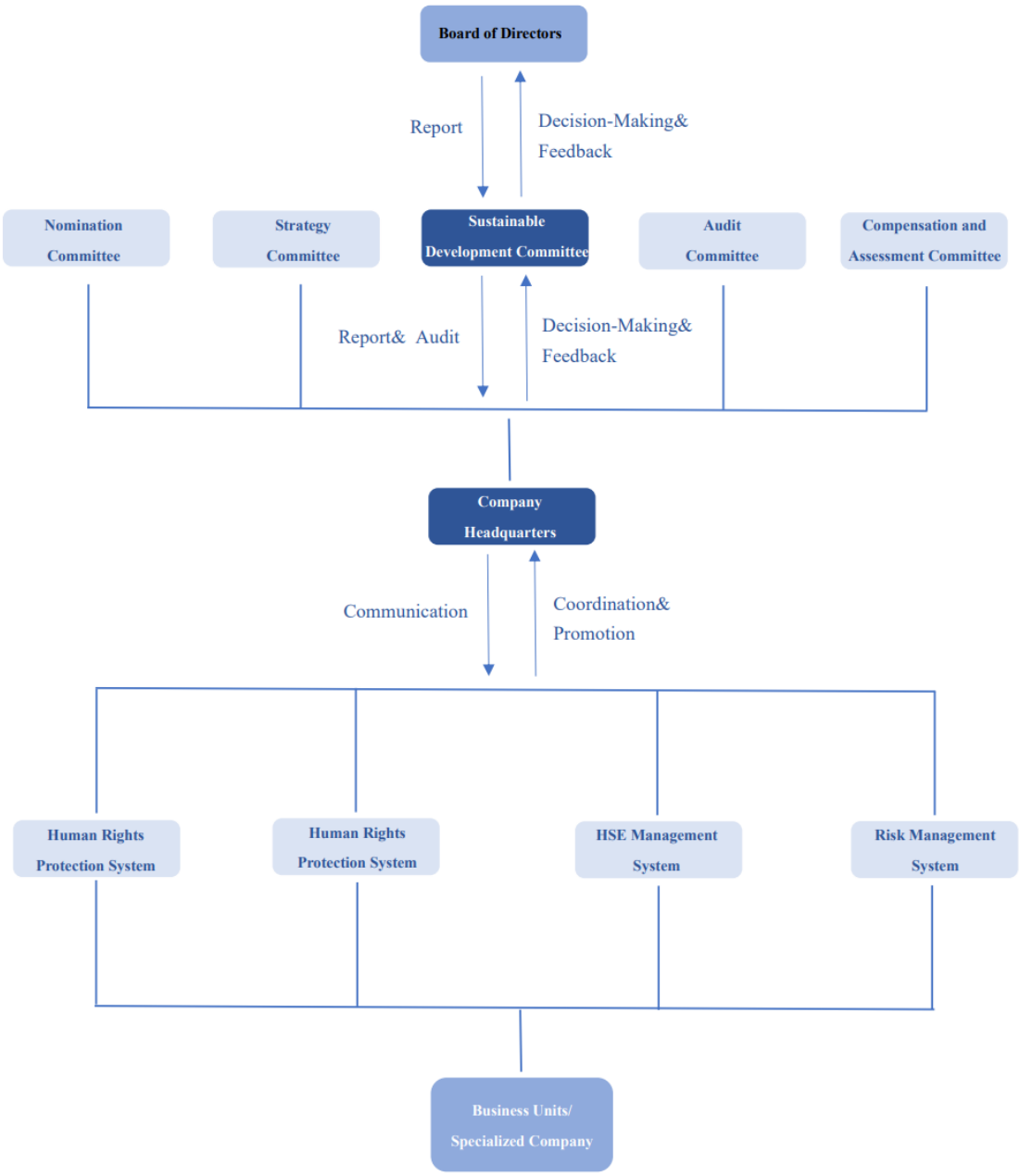

Figure 3. Sinopec Group Corporate Governance Structure

Reference: Sinopec Group Sustainability Report 2022

Based on the above organizational chart, the Board of Directors is the highest decision-making body for the company's ESG governance, responsible for overall planning and coordination of ESG matters. Additionally, the Board of Directors establishes the Sustainable Development Committee, chaired by the Chairman, to oversee and review the company's ESG strategy, objectives, and annual work plans. The committee reports on ESG implementation results and major initiatives to the Board of Directors. Furthermore, the Strategic Committee and the Audit Committee are also involved in reviewing and making decisions on ESG-related matters such as climate change response and health and safety

assurance. The company headquarters is responsible for coordinating, overseeing, and promoting the implementation of ESG-related work. The Energy Management and Environmental Protection Department, Safety Supervision Department, Human Resources Department, Enterprise Reform, and Legal Department, along with other relevant departments, are specifically responsible for managing various specialized ESG issues. Finally, the subsidiary companies are responsible for executing and implementing specific tasks according to the ESG management system, overall planning, and objectives.

4. Deficiencies and Suggestions for Low Carbon Transition in Sinopec Group

China Petrochemical Corporation, as a leading company actively promoting low-carbon transformation and sustainable development, deserves praise and recognition for its efforts and achievements in environmental, social, and governance (ESG) aspects. However, there are still some areas of improvement in ESG reporting, transparency in information disclosure, and "green supply chain" construction. Based on the aforementioned issues, the following are relevant improvement suggestions:

4.1 Establish ESG Targets and Enhance Reporting

In the current "China Petrochemical Sustainable Development Report," there is a lack of data support for the achievements and development status. It is recommended to present a more comprehensive view of information from various dimensions in the ESG report. Particular attention should be paid to providing specific data disclosure in environmental dimensions, such as carbon emissions, water resource management, and ecological conservation. In the social dimension, emphasis should be placed on strengthening content related to employee safety, training, and welfare to showcase the company's commitment to its employees. Regarding governance, transparently disclosing information on high-level decision-making and corporate governance structure will enhance investors' and shareholders' confidence in China Petrochemical. Lastly, establishing clear ESG targets and indicators to measure and monitor the progress of low-carbon transformation and sustainable development is recommended. Ensure these goals align with the company's strategic planning and incorporate them into long-term business development plans. Having measurable indicators will make ESG targets more actionable and traceable.

4.2 Formulate Sustainable Procurement Policies

Recommend the formulation of clear sustainable procurement policies that incorporate environmental and social responsibility requirements into the evaluation criteria for procurement decisions. Consider sourcing raw materials, products, and services from renewable resources and environmentally friendly suppliers to reduce environmental impact and social risks. In supplier selection processes, give priority to those with environmental certifications or compliance with sustainable standards and establish partnerships with them to jointly promote the construction of a green supply chain, contributing to the industry's sustainable development. Conduct environmental assessments and monitoring for key suppliers to understand their environmental practices and performance. Regularly review the environmental and social performance of suppliers to ensure their compliance with China Petrochemical's sustainable procurement standards. Encourage China Petrochemical to provide training

and support to suppliers to help them understand and comply with sustainable procurement requirements. Collaboratively establish training programs and resources to enhance suppliers' capabilities in environmental and social responsibility.

4.3 Establish a "Green Supply Chain"

To promote the construction of a green supply chain, recommend that China Petrochemical collaborates with suppliers to optimize logistics and transportation methods, reducing carbon emissions and resource waste. Encourage suppliers to adopt environmentally friendly packaging and recycled materials to minimize waste generation. Lastly, provide regular reporting to stakeholders on the progress and achievements of sustainable procurement and green supply chain. Transparently disclosing China Petrochemical's actions in environmental and social responsibility will enhance the company's image and reputation.

5. Conclusion

The acceleration of green and low-carbon transformation in the petroleum and chemical industry is not only an inevitable requirement for promoting high-quality development but also of crucial significance for China's achievement of its "dual carbon" goal. Faced with the pressure of environmental protection, China Petrochemical Corporation (Sinopec) must proactively embrace the energy and technological revolutions, adapt to the trends of green, diversified, and high-end development, and prioritize the establishment of a "green supply chain." On the social and corporate governance fronts, Sinopec should set clear ESG targets and indicators while increasing stakeholder engagement. By doing so, the company can effectively address environmental challenges and demonstrate its commitment to sustainable practices. Looking to the future, it is hoped that Sinopec will continue to enhance its technological capabilities to lead the way in the industry. This involves accelerating the reduction of carbon emissions from existing operations and promoting low-carbon development in new ventures. Simultaneously, Sinopec should actively build a new energy system and modern petrochemical industry, playing a greater role in achieving the "dual carbon" goal and making significant contributions to environmental conservation.

References

Eccles, R. G., Lee, L. E., & Stroehle, J. C. (2020). The social origins of ESG: An analysis of Innovest and KLD. *Organization & Environment*, *33*(4), 575-596. https://doi.org/10.1177/1086026619888994

Foxon, T. J. (2011). A coevolutionary framework for analysing a transition to a sustainable low carbon economy. *Ecological economics*, *70*(12), 2258-2267. https://doi.org/10.1016/j.ecolecon.2011.07.014

Li, T. T., Wang, K., Sueyoshi, T., & Wang, D. D. (2021). ESG: Research progress and future prospects. *Sustainability*, *13*(21), 11663. https://doi.org/10.3390/su132111663

Madison, N., & Schiehll, E. (2021). The effect of financial materiality on ESG performance assessment. *Sustainability*, *13*(7), 3652. https://doi.org/10.3390/su13073652

Nader, S. (2009). Paths to a low-carbon economy—The Masdar example. *Energy Procedia*, *1*(1), 3951-3958. https://doi.org/10.1016/j.egypro.2009.02.199

Palacios, L. (2021). *The Impact of ESG on National Oil Companies*. Center on Global Energy Policy.