

Research on Government Governance Measures for Achieving Carbon Neutrality in Anhui Province

Yiting Wu*

Anhui University of Finance and Economics, Bengbu 233000, China

*Corresponding Author

Abstract

The issue of global climate change is becoming increasingly severe, prompting countries to set carbon neutrality goals to prevent the continuous rise in global temperatures. In 2020, the Chinese government announced its goal to achieve carbon neutrality by 2060. However, meeting this target by 2060 poses a significant challenge for the entire nation. As a key province in central China, Anhui faces serious carbon emission challenges. Achieving carbon neutrality smoothly requires the government's active role, which is closely related to the national high-quality development strategy. Anhui Province has actively formulated relevant policies to achieve its dual carbon goals, developed an action plan for peaking carbon dioxide emissions across the province, and established scientific action guidelines for carbon emissions in different regions and industries. By strictly implementing the dual carbon policies, Anhui aims to create a beautiful ecological environment with bluer skies and clearer waters. This paper will explore the government governance measures necessary for Anhui Province to achieve its carbon neutrality goals, based on its actual circumstances.

Keywords

Government Governance; High-quality Development; Carbon Neutrality; Governance Measures.

1. Introduction

Global climate change is one of the most severe environmental challenges the world faces today^[1]. With the continuous advancement of industrialization and urbanization, human activities have emitted a large amount of greenhouse gases, particularly carbon dioxide, leading to global temperature rises, frequent extreme weather events, rising sea levels, and reduced biodiversity^[2]. Addressing climate change has become a consensus and an urgent task for the international community^[3-4]. Since the economic reforms and opening up, China has made significant progress in its national economy, and the standard of living for its people has markedly improved^[5-6]. After nearly three decades of rapid development, China surpassed Japan in 2010 to become the world's second-largest economy^[7]. However, this rapid economic growth has been accompanied by severe environmental issues, causing significant deterioration of the ecological environment and posing a substantial impact on the country's sustainable and high-quality development^[8-9]. Currently, China is the world's largest emitter of carbon, accounting for about 30% of global carbon emissions, which is roughly twice that of the entire European Union and three times that of the United States during the same period^[10-11]. As the largest developing country and a major carbon emitter, China bears significant responsibility for global climate governance^[12-13]. In September 2020, Chinese President Xi Jinping announced at the 75th United Nations General Assembly that China aims to peak carbon emissions by 2030 and achieve carbon neutrality by 2060^[14-15]. This goal underscores China's

commitment and responsibility in addressing climate change and promoting green development^[16-17]. The announcement of this target not only drives various industries to reduce carbon emissions but also serves as a critical condition for adjusting the country's industrial structure, advancing high-quality economic development, and achieving the great rejuvenation of the Chinese nation. Carbon neutrality, also known as net-zero carbon emissions, refers to offsetting carbon dioxide emissions produced by human activities through measures such as afforestation, developing renewable energy, and improving energy efficiency, thereby achieving "zero emissions" of carbon dioxide^[18-19]. Achieving carbon neutrality is of great significance for combating global climate change, maintaining ecological balance, and promoting sustainable economic development. It is not only an environmental protection measure but also a new economic development opportunity^[20-21]. Emerging sectors such as the low-carbon economy, green industries, and renewable energy will become new drivers of economic growth. Additionally, achieving carbon neutrality can enhance national energy security, reduce dependence on fossil fuels, and promote energy structure optimization^[22-23].

Anhui Province, located in central China, is an important industrial base and energy production area in the country. In recent years, with rapid economic development, the energy consumption and carbon emissions of Anhui Province have been increasing. According to data from the Anhui Provincial Department of Environmental Protection, the province's carbon emissions in 2019 were approximately 400 million tons, primarily concentrated in the industrial, transportation, and residential sectors^[24-25]. The province's energy structure is dominated by coal, which accounts for over 70% of total energy consumption. The high-energy-consuming and high-emission industrial and energy structures present significant challenges for Anhui Province in achieving its carbon neutrality goals^[26-27]. Moreover, the province's relatively weak technological innovation capacity and insufficient development and application of low-carbon technologies are also major constraints in achieving carbon neutrality^[28]. The purpose of this study is to analyze the challenges Anhui Province faces in achieving carbon neutrality and to explore government governance measures suitable for the province's actual situation^[29]. By summarizing advanced domestic and international experiences in carbon neutrality governance, this paper proposes specific measures for Anhui Province in areas such as policy guidance, technological innovation, industrial structure adjustment, and public participation. These measures aim to provide theoretical support and practical guidance for Anhui Province to achieve its carbon neutrality goals^[29-30]. Achieving carbon neutrality is not only an important task for environmental protection and sustainable development in Anhui Province but also a new opportunity for enhancing regional competitiveness and economic development. This paper systematically analyzes and proposes comprehensive governance measures to promote substantial progress for Anhui Province on the path to carbon neutrality, providing valuable references for nationwide carbon neutrality efforts. By considering the actual situation in Anhui Province, this paper proposes a series of governance measures for achieving carbon neutrality. Through systematic analysis and comprehensive governance measures, it aims to drive substantial progress for Anhui Province on the path to carbon neutrality^[31]. The main contribution of this study is to provide theoretical support and practical guidance for Anhui Province's carbon neutrality efforts and offer valuable references for carbon neutrality governance nationwide.

2. Literature Review

2.1. Pathways to Achieving Carbon Neutrality

Energy structure transformation is the core of achieving carbon neutrality. Most studies indicate that developing renewable energy is the most effective way to achieve carbon

neutrality. Renewable energy sources such as wind, solar, and biomass can replace traditional fossil fuels and offer the advantages of reducing pollution and promoting sustainable development^[32]. For instance, Germany's "Energiewende" policy has significantly increased the proportion of renewable energy in its power supply, providing valuable experience for other countries^[33]. Further research suggests that energy transition requires not only technological progress but also policy support and market incentives. Governments should encourage the use of renewable energy through subsidies, tax incentives, and establish efficient market mechanisms to promote the efficient use and rational allocation of energy^[34]. Technological innovation is a significant driver for achieving carbon neutrality. Low-carbon technologies, energy-saving technologies, and carbon capture and storage (CCS) technologies play crucial roles in reducing carbon emissions^[35]. Research shows that technological advancements can improve energy efficiency, reduce abatement costs, and drive the green transformation of the economy^[35]. For example, the United States has made significant progress in promoting wind and solar technologies, which has not only significantly reduced carbon emissions but also stimulated the development of related industries. Future research should focus more on the development and application of emerging technologies such as hydrogen energy and energy storage technologies, which are expected to further enhance energy efficiency and sustainability, providing stronger technical support for achieving carbon neutrality^[36]. Policy guidance is a necessary guarantee for achieving carbon neutrality. Policy tools such as carbon taxes, carbon trading, and environmental regulations are widely used to promote carbon reduction^[37]. The European Union's Emissions Trading System (ETS) and China's carbon emission trading market are typical examples of policy practices that use market mechanisms to facilitate carbon reduction. Studies have found that the design and execution of policies directly impact the achievement of carbon neutrality goals. For instance, the EU, when designing its ETS, fully considered the economic development levels and industrial structure differences among its member states, setting flexible quota allocation and trading mechanisms, which enhanced the policy's operability and effectiveness. Future research should further explore how to optimize policy design and improve policy enforcement to ensure effective implementation and advancement toward carbon neutrality goals^[38].

2.2. Implementation Effects of Carbon Neutrality Policies

Research on the implementation effects of policies primarily focuses on the design, execution, and evaluation of results. Evaluating the effectiveness of different policies can provide scientific evidence for future policy formulation. Research indicates that policy design should consider regional differences and industry characteristics, tailoring strategies to specific circumstances. For example, the European Union's design of the Emissions Trading System (ETS) accounted for the economic development levels and industrial structure differences among member states, setting flexible quota allocation and trading mechanisms to enhance policy operability and effectiveness^[39]. Specifically, research highlights that policy design requires not only macro-level strategic planning but also micro-level concrete measures, such as differentiated management for key industries and enterprises, and flexible policy arrangements for different regions to ensure precision and effectiveness. The execution of policies directly impacts the achievement of carbon neutrality goals. Studies highlight that the key to policy execution lies in government supervision and corporate cooperation^[40]. For instance, the United States effectively controlled industrial carbon emissions through strict regulation and enforcement. Simultaneously, incentive mechanisms encouraged companies to adopt technological upgrades and energy-saving measures, enhancing policy execution. Research also finds that the effectiveness of policy execution depends on the coordination and capability of government departments^[1]. Future research should focus on improving the efficiency and effectiveness of

policy execution to ensure policies are effectively implemented. Evaluating policy effects is crucial for policy optimization. Research employs a combination of quantitative and qualitative analyses to comprehensively assess the implementation effects of policies^[26]. For example, by establishing carbon emission inventories and carbon footprint models, researchers can quantify the changes in carbon emissions before and after policy implementation, providing a basis for policy adjustments^[18]. Specifically, research suggests that policy evaluation should focus on both short-term effects and long-term impacts. Continuous monitoring and evaluation can identify problems and deficiencies in policy implementation, leading to necessary adjustments and optimization to ensure the long-term effectiveness and sustainability of policies^[25].

2.3. Industrial Structure Adjustment and Low-Carbon Economy

Adjusting the industrial structure is a vital pathway to achieving carbon neutrality^[12]. Research primarily focuses on industrial transformation and upgrading, the development of low-carbon industries, and economic benefits. Adjusting the industrial structure to promote the green transformation of the economy is an essential means of achieving carbon neutrality. Research indicates that the green transformation of traditional high-energy-consuming industries is a necessary choice for achieving carbon neutrality^[15]. Through technological upgrades, improving energy efficiency, and reducing pollution emissions, traditional industries can achieve low-carbon transformation. For example, the Chinese steel industry has significantly reduced carbon emissions and enhanced its green competitiveness through technological upgrades and cleaner production. Research also points out that industrial transformation and upgrading require not only technological progress but also policy support and market guidance^[15]. Government incentives can drive enterprises to adopt technological upgrades and industry transformation, promoting green economic development and high-quality growth. The development of low-carbon industries is a key driver for achieving carbon neutrality. Research suggests that the growth of low-carbon industries such as new energy, new materials, and energy conservation and environmental protection can reduce carbon emissions and drive economic growth. For instance, Germany's significant development of the renewable energy industry has not only achieved a green energy transition but also created numerous job opportunities^[2]. Research also finds that the development of low-carbon industries requires policy support and market incentives. Government guidance and market incentives can promote the growth of low-carbon industries, driving the green transformation and sustainable development of the economy^[8]. The development of a low-carbon economy has significant economic benefits. Research shows that the growth of low-carbon industries can reduce carbon emissions while improving the quality and efficiency of economic growth. For example, the United Kingdom has achieved a decoupling of economic growth from carbon emissions by developing a low-carbon economy, enhancing its green economic competitiveness. Research also indicates that the development of a low-carbon economy requires policy support and market guidance. Government incentives and market incentives can drive the growth of low-carbon industries, promoting green economic transformation and high-quality development^[13]. Through a comprehensive analysis of domestic and international research on carbon neutrality, it is evident that achieving carbon neutrality goals requires comprehensive governance measures, including technological innovation, policy guidance, industrial structure adjustment, and public participation. International research emphasizes technological innovation and policy implementation, using quantitative analysis and model simulation methods to focus on global cooperation and international experiences. Domestic research focuses more on policy design and industrial structure adjustment, using case studies and empirical research methods to address the actual circumstances of the country and regions. Overall, domestic and

international research complement each other, collectively advancing the development of carbon neutrality theory and practice^[9]. In achieving its carbon neutrality goals, Anhui Province can draw on advanced domestic and international experiences and formulate scientifically sound governance measures based on its actual conditions. Through comprehensive measures such as technological innovation, policy guidance, industrial structure adjustment, and public participation, Anhui Province is expected to make substantial progress on the path to carbon neutrality, providing valuable references for national carbon neutrality efforts^[16].

3. Carbon Neutrality Policy Measures in Anhui Province

Under the guidance of national policies aimed at improving the ecological environment and promoting carbon neutrality and peak carbon goals, numerous experts and scholars in China have offered unique insights^[10]. Some scholars have provided detailed explanations of China's current energy structure and development logic, which have significant implications for the vigorous promotion of an energy revolution in the new era and the development of a green energy-based economic structure^[20]. Additionally, the policies proposed by the Anhui Provincial Government have been analyzed for their practical guidance significance, focusing on aspects such as industrial scale, green low-carbon trading systems, innovation capabilities, and green energy storage capacities.

3.1. Strict Control of High Energy-Consuming Industry Scale and Project Numbers

Anhui Province, being a major agricultural province, has experienced rapid industrial development with the implementation of the Central Region Rise Strategy. In recent years, the province has seen increasing industrial output, driven by the relocation of industries from the Yangtze River Delta region. This industrial growth, along with a significant increase in both local and external high energy-consuming enterprises, has led to a notable rise in energy consumption. Anhui is a major coal-producing province in East China, with its coal resources primarily concentrated in the northern Huainan and Huaibei coalfields^[5]. The province has four large state-owned coal enterprises, with coal reserves estimated at about 61.159 billion tons. Despite the rich coal reserves, the coal consumption in Anhui continues to increase due to the production needs of high energy-consuming enterprises and limitations in mining conditions and actual mining volumes^[12]. Given the severe timeline for achieving carbon neutrality by 2060, the Anhui Provincial Government has proposed policies to strictly control the scale and number of high energy-consuming industries and projects. These measures include avoiding preferential policies such as discounted electricity rates for high energy-consuming enterprises and implementing power restrictions to prevent waste and gradually reduce the use of primary energy in the production processes of these enterprises^[16]. The government aims to improve relevant policies and regulations to ensure that emissions meet standards and further refine differential electricity pricing and tiered electricity pricing policies to align industrial and environmental policies closely^[7]. This alignment seeks to prevent policy implementation failures, ensuring consistent policy application and accelerating energy conservation and carbon reduction.

3.2. Exploring the Construction of a Green Low-Carbon Trading System and Promoting Low-Carbon Technology Development

In Anhui Province and across China, coal remains the primary energy source, with coal-fired power accounting for approximately 68% of China's electricity structure in 2020. Actively developing new energy sources can change the existing energy structure, increasing the proportion of clean energy and significantly reducing carbon dioxide emissions. For example,

enhancing the proportion of solar, nuclear, and other emerging energy sources, and establishing a comprehensive energy utilization system can significantly reduce carbon emissions^[12-16]. Particularly, increasing the share of nuclear energy is essential, as China's nuclear technology lags behind that of Western developed countries, and nuclear power accounts for only a small fraction of the country's overall power generation. While nuclear power in France accounts for 70% of the nation's electricity supply, it only represents 5% in China^[22]. For instance, a nuclear power plant requires only 50 tons of nuclear fuel annually, which can be transported in two standard containers, compared to 5.15 million tons of coal. Therefore, China needs to invest actively in nuclear energy, although site selection for nuclear power plants near water sources is challenging for Anhui, given its inland freshwater resources. Consequently, the province should focus on wind energy development, increasing funding and policy support for wind power. Innovation in low-carbon technologies, development of new energy vehicles, and simplifying policy approvals for clean energy transactions are also crucial^[28-41]. The Anhui Provincial Government should prevent enterprises or individuals from using low-carbon policies to exceed emission standards and strictly punish such behaviors to ensure timely policy implementation, providing support for low-carbon trading and technology development^[20].

3.3. Enhancing Technological Innovation Capacity for Low-Carbon Technological Support

Anhui Province has relatively mature green energy utilization. In the automotive industry, Anhui hosts established brands like JAC Motors and Chery Automobile, and in the new energy vehicle sector, NIO. These brands have been increasing their market share and development in new energy vehicles. For example, NIO has a strong competitive presence among mid-to-high-end brands in China^[12]. On September 23, 2021, Volkswagen Group (China) announced an investment of over 140 million euros in a battery system factory in Hefei, Anhui, highlighting significant advancements in green energy utilization. High-tech companies in Anhui, such as iFlytek, BOE, and JA Solar, have been increasing their investment in high-tech fields, continuously making breakthroughs in low-carbon, zero-carbon, and negative-carbon technologies. The Anhui Provincial Government actively guides these enterprises, positioning Anhui at the forefront of the country's high-tech, low-carbon, and zero-carbon industries. Despite the increasing carbon consumption in the province, comprehensive governance policies have maintained an industrial output growth rate of over 10%. During the COVID-19 pandemic in 2020, the industrial output growth rate in Anhui dropped but rebounded afterward, indicating new development opportunities in the post-pandemic era^[29]. During the 14th Five-Year Plan period and beyond, Anhui must strengthen technical and policy support to achieve high-quality economic development and transition towards a green ecological environment while aiming for carbon peak and carbon neutrality goals^[21].

3.4. Promoting the Construction of Green Energy Storage Bases and Increasing the Proportion of Imported Clean Energy

As previously mentioned, Anhui Province is a major coal-producing province in central and eastern China. Under the carbon neutrality goal, increasing the use of clean energy is imperative^[28]. To address the province's green energy scarcity, the government should first formulate policies supporting energy storage technology development, including financial subsidies, tax incentives, and technical research support. Establishing and improving the energy storage market mechanism will promote the commercial operation of energy storage stations, enhancing the economic viability and sustainability of energy storage projects and attracting more private investment. Additionally, cooperation with neighboring provinces should be strengthened to build efficient, stable power transmission channels to ensure a stable

supply of external clean electricity^[42]. For example, collaboration with regions rich in clean energy resources, such as Inner Mongolia and Xinjiang, can utilize their abundant wind and solar energy through ultra-high voltage transmission technology to supply clean electricity to Anhui, reducing reliance on coal power^[17]. Finally, constructing smart grid systems by integrating energy storage technology with smart grids will enable intelligent power system scheduling and management^[19]. Leveraging big data, artificial intelligence, and other technological means can enhance the efficiency and stability of the power system, optimizing the allocation and utilization of power resources.

4. Policy Recommendations

4.1. Improve Resource Utilization and Strengthen Policies and Regulation

Due to Anhui Province's reliance on a single resource structure, primarily composed of primary energy, it is crucial to optimize the utilization of renewable energy during policy guidance to prevent excessive waste of resources and limit the proportion of primary energy use. The carbon reduction policies aimed at achieving carbon neutrality should include administrative penalties to prevent excessive carbon emissions from high energy-consuming enterprises. In terms of wind energy utilization, suitable locations should be actively sought to increase wind energy reserves. Exploring new pathways in energy structure will help align the energy economy structure with the ecological civilization construction in the new era.

In terms of strengthening policies and supervision, Anhui Province should start from the following aspects. Firstly, a comprehensive carbon neutrality policy system should be established and improved, covering sectors like energy, industry, transportation, and construction, with clear carbon reduction targets and measures for each department and industry^[43]. A robust carbon emission statistics, monitoring, and evaluation system should be developed to provide scientific evidence for policy formulation and implementation. Secondly, environmental regulation and law enforcement should be strengthened. There should be strict supervision of high energy-consuming and high-emission enterprises, with rigorous enforcement of environmental protection laws and regulations. Specialized regulatory agencies should be set up to conduct regular environmental inspections, ensuring that enterprises comply with carbon emission standards and requirements^[8]. Finally, promoting the construction of a carbon trading market is essential. Accelerating the establishment of a carbon trading market and developing a comprehensive carbon emission trading mechanism will help achieve carbon reduction targets through market-based methods, improving the allocation efficiency of carbon resources. Enterprises should be encouraged to actively participate in carbon trading, promoting overall societal carbon reduction^[10].

4.2. Promote the Development of Green Energy Storage Technologies and Infrastructure

Construct large-scale battery storage stations and pumped storage power stations in renewable energy bases and power load centers to improve the grid's regulation capacity and stability. Formulate special support policies to support the research and application of energy storage technologies. Encourage the construction of distributed energy storage systems in industrial parks, commercial areas, and residential areas^[17-43]. Through policy guidance and market incentives, promote the installation of energy storage devices in homes, communities, and enterprises to enhance energy efficiency and autonomous regulation capabilities. Additionally, promote the integration of energy storage with smart grids. Develop smart grid systems that combine energy storage technology with smart grids to achieve intelligent dispatch and

management of the power system. Utilize big data, artificial intelligence, and other technologies to optimize the allocation and utilization of power resources^[16].

4.3. Optimizing Industrial Structure to Promote Green Economic Transformation

First, promote the green transformation of traditional industries. Achieve the green transformation of traditional high-energy-consumption, high-emission industries through technological transformation, improved energy efficiency, and reduced pollution emissions. Formulate and implement industrial green transformation plans, provide policy and financial support, and help enterprises achieve clean production^[8-18]. Second, develop low-carbon industries. Vigorously develop low-carbon industries such as new energy vehicles, smart manufacturing, and new materials. Establish special funds to support the research and development and industrial application of low-carbon technologies, encouraging enterprises to carry out technological innovation and product upgrades. Finally, strengthen green financial support. Promote the development of green finance, establish special green finance funds, and guide social capital towards low-carbon and environmental protection fields. Formulate green financial policies, provide tax incentives and financial subsidies, and encourage financial institutions to increase support for green projects^[10].

4.4. Raising Public Environmental Awareness and Promoting Social Participation

First, strengthen environmental protection publicity and education. Improve public environmental awareness and knowledge through various forms such as school education, community activities, and media publicity. Conduct environmental knowledge popularization activities to cultivate public environmental behavior and low-carbon lifestyles^[8-10]. Second, promote a green lifestyle. Advocate for green lifestyles and promote energy-saving and emission-reducing living habits. Through policy guidance and market incentives, encourage residents to practice low-carbon concepts in aspects such as clothing, food, housing, and transportation, such as choosing public transportation, green consumption, and waste classification^[5]. Finally, promote public participation in carbon reduction actions. Formulate and implement incentive policies for public participation in carbon reduction, encouraging the public to actively participate in carbon reduction actions. Through reward mechanisms and subsidy policies, mobilize the public's enthusiasm for participating in carbon reduction, thereby improving the overall social carbon reduction effect.

5. Conclusion

In the context of global climate change, carbon neutrality has become a focal point for governments and societies worldwide. For Anhui Province, an important industrial and energy-producing region in China, achieving the goal of carbon neutrality is not only a necessity for environmental protection but also a crucial measure for promoting high-quality economic development. This paper analyzes the theoretical foundations of carbon neutrality, the effectiveness of policy implementation, industrial structure adjustment, low-carbon economic development, and the current state of public participation and environmental awareness both domestically and internationally. Based on this analysis, specific policy recommendations for Anhui Province to achieve carbon neutrality are proposed. Achieving carbon neutrality is a complex project that requires the concerted efforts of the government, enterprises, and all sectors of society. By scientifically formulating policies, actively promoting technological innovation, reasonably adjusting industrial structures, and widely mobilizing public participation, Anhui Province can achieve its carbon neutrality goals while driving sustainable

economic and social development. This will enhance the overall environmental quality and improve the living standards of its residents. The specific policy recommendations provided in this paper aim to offer theoretical support and practical guidance for carbon neutrality efforts, with the expectation of achieving significant results in future implementation.

Acknowledgments

This work was supported by a grant from Anhui University of Finance and Economics Postgraduate Student Fund Innovation Program (ACYC2023001).

References

- [1] Zhu, Y. M., & Lu, S. (2024). Digital Economy and Carbon Neutrality: Exploring the Pathways and Implications for China's Sustainable Development. *Journal of the Knowledge Economy*, 18.
- [2] Zhang, H. W., Ben, F., & Qin, M. (2024). Mineral resources, tourism, human capital, and carbon neutrality: A path towards balanced and sustainable development. *Resources Policy*, 90, 9.
- [3] Umar, M., Ji, X. F., Safi, A., & Afshan, S. (2024). Decentralization, institutional quality, and carbon neutrality: Unraveling the nexus in China's pursuit of sustainable development. *Economic Analysis and Policy*, 82, 1238-1249.
- [4] Mohsin, M., Hu, X. H., Sarfraz, M., & Naseem, S. (2024). Going green for good: How sustainable economic development and green energy resources are driving carbon neutrality in G-7 countries? *Sustainable Development*, 32(1), 1226-1242.
- [5] Elahi, E., Zhu, M., Khalid, Z., & Wei, K. Z. (2024). An empirical analysis of carbon emission efficiency in food production across the Yangtze River basin: Towards sustainable agricultural development and carbon neutrality. *Agricultural Systems*, 218, 12.
- [6] Dhull, S. B., Rose, P. K., Rani, J., Goksen, G., & Bains, A. (2024). Food waste to hydrochar: A potential approach towards the Sustainable Development Goals, carbon neutrality, and circular economy. *Chemical Engineering Journal*, 490, 15.
- [7] Chen, P. Y., & Li, J. L. (2024). Sustainable agricultural management: How to achieve carbon neutrality in agriculture - evidence from China agricultural sustainable development plan. *Sustainable Development*, 32(3), 2846-2857.
- [8] Wen, H. W., Liang, W. T., & Lee, C. C. (2023). China's progress toward sustainable development in pursuit of carbon neutrality: Regional differences and dynamic evolution. *Environmental Impact Assessment Review*, 98, 14.
- [9] Song, M. J., & Lee, H. Y. (2023). How to lead on carbon neutrality through sustainable development: A perspective on renewable energy, Information and Communication Technology (ICT), and logistics networks. *Environmental Science and Pollution Research*, 30(47), 103776-103787.
- [10] Saqib, N., Usman, M., Radulescu, M., Serbu, R. S., Kamal, M., & Belascu, L. A. (2023). Synergizing green energy, natural resources, global integration, and environmental taxation: Pioneering a sustainable development goal framework for carbon neutrality targets. *Energy & Environment*, 25.
- [11] Obobisa, E. S. (2023). An econometric study of eco-innovation, clean energy, and trade openness toward carbon neutrality and sustainable development in OECD countries. *Sustainable Development*, 25.
- [12] Adebayo, T. S., & Ullah, S. (2023). Formulating sustainable development policies for China within the framework of socioeconomic conditions and government stability. *Environmental Pollution*, 328, 9.
- [13] Xia, L., Gao, S., Wei, J. C., & Ding, Q. Y. (2022). Government subsidy and corporate green innovation - Does board governance play a role? *Energy Policy*, 161, 15.
- [14] Wang, X. Y., Khurshid, A., Qayyum, S., & Calin, A. C. (2022). The role of green innovations, environmental policies and carbon taxes in achieving the sustainable development goals of carbon neutrality. *Environmental Science and Pollution Research*, 29(6), 8393-8407.

- [15] Shahbaz, M., Wang, J. D., Dong, K. Y., & Zhao, J. (2022). The impact of digital economy on energy transition across the globe: The mediating role of government governance. *Renewable & Sustainable Energy Reviews*, 166, 14.
- [16] Hussain, J., & Lee, C. C. (2022). A green path towards sustainable development: Optimal behavior of the duopoly game model with carbon neutrality instruments. *Sustainable Development*, 30(6), 1523-1541.
- [17] Deng, J., Zhang, Y., Xing, X. Y., & Liu, C. (2022). Can Carbon Neutrality Commitment Contribute to the Sustainable Development of China's New Energy Companies? *Sustainability*, 14(18), 20.
- [18] Castro, C., & Lopes, C. (2022). Digital Government and Sustainable Development. *Journal of the Knowledge Economy*, 13(2), 880-903.
- [19] Bai, X. L. (2022). Exploring the Sustainable Development Path of a Green Financial System in the Context of Carbon Neutrality and Carbon Peaking: Evidence from China. *Sustainability*, 14(23), 25.
- [20] Kamei, M., Wangmo, T., Leibowicz, B. D., & Nishioka, S. (2021). Urbanization, carbon neutrality, and Gross National Happiness: Sustainable development pathways for Bhutan. *Cities*, 111, 10.
- [21] Jiang, X., Li, G. L., & Fu, W. (2021). Government environmental governance, structural adjustment and air quality: A quasi-natural experiment based on the <i>Three</i>-<i>year Action Plan to Win the Blue Sky Defense War</i>. *Journal of Environmental Management*, 277, 8.
- [22] Hu, D., Qiu, L., She, M. Y., & Wang, Y. (2021). Sustaining the sustainable development: How do firms turn government green subsidies into financial performance through green innovation? *Business Strategy and the Environment*, 30(5), 2271-2292.
- [23] Hepburn, C., Qi, Y., Stern, N., Ward, B., Xie, C. P., & Zenghelis, D. (2021). Towards carbon neutrality and China's 14th Five-Year Plan: Clean energy transition, sustainable urban development, and investment priorities. *Environmental Science and Ecotechnology*, 8, 8.
- [24] Abbasi, K. R., Hussain, K., Radulescu, M., & Ozturk, I. (2021). Does natural resources depletion and economic growth achieve the carbon neutrality target of the UK? A way forward towards sustainable development. *Resources Policy*, 74, 12.
- [25] Wu, L. H., Ma, T. S., Bian, Y. C., Li, S. J., & Yi, Z. Q. (2020). Improvement of regional environmental quality: Government environmental governance and public participation. *Science of the Total Environment*, 717, 12.
- [26] Ilyas, S., Hu, Z. N., & Wiwattanakornwong, K. (2020). Unleashing the role of top management and government support in green supply chain management and sustainable development goals. *Environmental Science and Pollution Research*, 27(8), 8210-8223.
- [27] Gupta, D., & Garg, A. (2020). Sustainable development and carbon neutrality: Integrated assessment of transport transitions in India. *Transportation Research Part D-Transport and Environment*, 85, 25.
- [28] Forestier, O., & Kim, R. E. (2020). Cherry-picking the Sustainable Development Goals: Goal prioritization by national governments and implications for global governance. *Sustainable Development*, 28(5), 1269-1278.
- [29] Christensen, T., & Laegreid, P. (2020). Balancing Governance Capacity and Legitimacy: How the Norwegian Government Handled the COVID-19 Crisis as a High Performer. *Public Administration Review*, 80(5), 774-779.
- [30] Buijs, A., Hansen, R., van der Jagt, S., Ambrose-Oji, B., Elands, B., Rall, E. L., . . . Moller, M. S. (2019). Mosaic governance for urban green infrastructure: Upscaling active citizenship from a local government perspective. *Urban Forestry & Urban Greening*, 40, 53-62.
- [31] Kapera, I. (2018). Sustainable tourism development efforts by local governments in Poland. *Sustainable Cities and Society*, 40, 581-588.
- [32] Janowski, T. (2016). Implementing Sustainable Development Goals with Digital Government - Aspiration-capacity gap. *Government Information Quarterly*, 33(4), 603-613.
- [33] Charron, N., Dijkstra, L., & Lapuente, V. (2014). Regional Governance Matters: Quality of Government within European Union Member States. *Regional Studies*, 48(1), 68-90.

- [34] Steurer, R. (2013). Disentangling governance: a synoptic view of regulation by government, business and civil society. *Policy Sciences*, 46(4), 387-410.
- [35] Margetts, H., & Dunleavy, P. (2013). The second wave of digital-era governance: a quasi-paradigm for government on the Web. *Philosophical Transactions of the Royal Society a-Mathematical Physical and Engineering Sciences*, 371(1987), 17.
- [36] Speer, J. (2012). Participatory Governance Reform: A Good Strategy for Increasing Government Responsiveness and Improving Public Services? *World Development*, 40(12), 2379-2398.
- [37] Lowndes, V., & Pratchett, L. (2012). Local Governance under the Coalition Government: Austerity, Localism and the 'Big Society'. *Local Government Studies*, 38(1), 21-40.
- [38] Borisova, G., Brockman, P., Salas, J. M., & Zagorchev, A. (2012). Government ownership and corporate governance: Evidence from the EU. *Journal of Banking & Finance*, 36(11), 2917-2934.
- [39] Opschoor, H. (2011). Local sustainable development and carbon neutrality in cities in developing and emerging countries. *International Journal of Sustainable Development and World Ecology*, 18(3), 190-200.
- [40] Howlett, M., Rayner, J., & Tollefson, C. (2009). From government to governance in forest planning? Lessons from the case of the British Columbia Great Bear Rainforest initiative. *Forest Policy and Economics*, 11(5-6), 383-391.
- [41] Ruhanen, L. (2013). Local government: facilitator or inhibitor of sustainable tourism development? *Journal of Sustainable Tourism*, 21(1), 80-98.
- [42] Quan, Y., Wu, H. Y., Li, S. H., & Ying, S. X. (2018). Firm sustainable development and stakeholder engagement: The role of government support. *Business Strategy and the Environment*, 27(8), 1145-1158.
- [43] Cao, W. R., Cai, Z. J., Yao, X., & Chen, L. F. (2023). Digital Transformation to Help Carbon Neutrality and Green Sustainable Development Based on the Metaverse. *Sustainability*, 15(9), 15.