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Original Paper

Research on the Overseas Development of New Energy Vehicles – ESG Three-Dimensional Analysis Based on Indonesia

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Abstract

Driven by the global carbon neutrality goal and the concept of sustainable development, China's new energy vehicle exports have grown rapidly, and Southeast Asia, especially Indonesia, has become a key strategic market. Based on the three-dimensional framework of ESG (environment, society, and governance), this paper systematically analyzes the regulatory compliance challenges and opportunities faced by Chinese new energy vehicle companies in the process of "going overseas" to Indonesia. Through literature research, case comparison, and field investigation, BYD and Toyota's investment strategies in Indonesia are selected for in-depth comparison to reveal key influencing factors in localized production, market adaptation, and policy response. At the same time, from a legal perspective, Indonesia's regulatory requirements in terms of labor employment, religious culture, social responsibility, and governance structure are sorted out in detail to provide compliance guidance for Chinese new energy vehicle companies. The study aims to provide policy recommendations for the overseas development of enterprises from a legal perspective, promote the internationalization of China's new energy industry, and inject new impetus into China-Indonesia green cooperation.

Keywords

ESG, new energy vehicles, Indonesian market, legal compliance, enterprises going overseas

1. Introduction

1.1 Research Background

The concept of ESG has gradually become the focus of global attention. With the popularization of the concept of sustainable development and the proposal of the "dual carbon" goal, its research has received widespread attention in China and around the world. Driven by the global carbon neutrality goal, the new energy vehicle industry has become the focus of strategic competition among countries. In 2023, China's new energy vehicle exports will exceed 1.2 million vehicles, of which the Southeast Asian market accounts for more than 30%. Indonesia, as the largest economy in ASEAN, has become the core target of Chinese auto companies' layout with its rich nickel ore resources and policy incentives. China's "Belt and Road" initiative is deeply connected with Indonesia's "Global Ocean Pivot" strategy, and environmental compliance issues directly affect the quality of bilateral cooperation.

1.2 Research Significance

The ESG evaluation system, also known as ESG Ratings, is based on the three aspects of environment, society, and governance. It is created by commercial and non-profit organizations to evaluate how a company's commitment, performance, business model, and structure are consistent with sustainable development goals. The primary goal of this project is to study the environmental regulatory compliance issues faced by new energy vehicle companies in exports under the ESG evaluation system and to deeply analyse and compare regulatory requirements, industry standards, and corporate practices in different countries and regions. Through in-depth literature reviews, expert interviews, and other methods, identify and analyse the commonalities and particularities of compliance issues and provide new energy vehicle companies with compliance solutions from a global perspective.

Explore the environmental issues of new energy vehicles and fully study their "duality": analyse the environmental benefits of new energy vehicles, including the reduction of tail gas emissions and carbon emissions, and at the same time study the impact of the production and manufacturing process of new energy vehicle batteries on the environment, including raw material collection, production technology, waste disposal, and other aspects.

Explore ways for companies to respond to sanctions and safeguard their exports effectively: In light of the current international economic situation, analyse how to deal with the "bottleneck" problems caused by sanctions in the context of the Sino-US trade war, especially under sanctions such as chip blockades and technology blockades, how companies can effectively circumvent sanctions.

Fully sublimation under globalization and multi-perspective research, and suggestions for the development of China's export trade: By deeply studying the global new energy vehicle issues from a legal perspective, it is helpful to enhance the international competitiveness of China's new energy vehicle companies and establish a global sales network. At the same time, exchanges and cooperation with governments of various countries and in-depth exchanges in technology and policies will help learn from the successful experiences of various countries and enhance the technical strength of automobile companies themselves and the scientific nature of policy formulation. Opening up a vast

global market through policy research can promote close cooperation between upstream and downstream companies, which is conducive to the overall upgrading of the entire industrial chain, including production, sales, services, and other links.

The research results of the project will help promote the concept of co-construction and sharing on a global scale. Sharing China's compliance experience in the field of new energy vehicles will promote resource sharing and mutually beneficial cooperation among countries, enhance friendly relations, consolidate China's image, and inject positive elements into China's foreign policy. Through the implementation of the project, it can promote the implementation of relevant foreign policies, deepen cooperation with participating countries based on practical solutions to environmental regulatory compliance issues, and promote the stable development of bilateral and multilateral diplomatic relations.

1.3 Research Methods

The research methods used in this project are mainly the comparative method, literature analysis method, case current affairs method, and field investigation method.

A comparative method is a research method that systematically compares different objects, phenomena, or cases to reveal their similarities, differences, laws, or causal relationships. This project compares various cases of compliance issues faced by Chinese new energy vehicle companies in export investment in Indonesia so as to gain a deeper understanding of compliance issues from the commonalities and differences.

Literature research is a method of obtaining information through literature investigation based on a certain research purpose or topic so as to fully and correctly understand the research issues. This project reviewed a large number of documents related to ESG compliance issues of multinational companies, including the concept of ESG and its role in companies, the current status and suggestions of corporate compliance issues, the problems and suggestions that Chinese new energy vehicle companies and other companies may face when investing overseas, and the legal provisions of countries such as Indonesia on investment, especially new energy vehicles, to understand the current status of relevant issues from existing research and form an overall impression of the compliance of new energy vehicle investment under the concept of ESG.

Field research is a research method that collects first-hand data by going deep into actual scenes, directly observing and participating in the life or activities of the research subjects. It emphasizes the interaction between researchers and research subjects in the environment to gain a deep understanding of complex phenomena. The research subjects of this project are mainly new energy vehicle companies in China that face export investment compliance issues. Through the use of field research methods, including interviews with relevant industry insiders, visits to relevant companies, and understanding the specific problems, we have a deep understanding of the specific problems faced by the companies and then closely combine the research topic with the actual situation to draw reliable conclusions and solutions.

This research project aims to write the research results into an academic paper and finally put forward conclusive suggestions from a legal perspective. By reaching a joint research cooperation with enterprises or adopting the research conclusions of this project after the enterprises reach cooperation, it will better promote Chinese new energy vehicle companies to solve the compliance issues they face when going overseas, and thus better promote the development of China's new energy vehicle industry.

1.4 Project Innovation

1.4.1 Innovation in Research Perspective

ESG three-dimensional framework analysis: Combining the three dimensions of environment (E), society (S), and governance (G), we comprehensively examine the compliance and legal issues of new energy vehicle exports to Indonesia rather than just being limited to traditional trade regulations.

Research on transnational legal conflicts: Comparing Chinese and Indian laws, analysing Indonesia's special environment, such as the EPR (Extended Producer Responsibility) system, and filling the existing research gaps.

In combination with the latest international policies, focus on the impact of the Paris Agreement, CBAM carbon tariffs, Indonesia's NDC emission reduction plan, and other policies on corporate compliance, and provide forward-looking research.

1.4.2 Target Market Innovation

Compliance analysis on the Indonesian new energy vehicle market, taking into account multiple factors such as environmental pollution, legal regulations, and localization rate (TKDN) requirements.

Special market environment analysis amongst which to research the potential impact of Muslim culture, Indonesia's localized production policy (TKDN), labor rights, etc., on new energy vehicle companies and provide targeted compliance advice.

1.4.3 Innovation in Research Methods

Multi-dimensional data support: Combining IQAir air quality data, LMC Automotive market data, and other multi-channel information to improve the accuracy of the research. Interdisciplinary research in which to integrate knowledge from the fields of law, economy, environment, society, and culture to provide a more comprehensive compliance framework for new energy vehicle companies.

Case analysis and field research by combining real cases with field investigations to enhance the practical value of research and provide stronger support for policy recommendations.

1.4.4 Enterprise Compliance Innovation

ESG response strategies for new energy vehicle companies by proposing compliance paths for the Indonesian market to help companies avoid legal risks and optimize environmental responsibilities.

Combining international law with local law to analyse the differences between international regulations (such as EU CBAM) and Indonesian regulations (such as the Investment Law and Labor Law) and provide compliance advice to multinational companies.

1.4.5 Project Cooperation with Enterprises

Conclusions and suggestions are drawn from the research on the project theme, and multi-dimensional research such as case analysis and comparison, policy market situation research, and legal and regulatory analysis can serve as a good investment and risk avoidance reference for enterprises.

2. Problems Raised and Current Research Status At Domestically and Externally

2.1 New Issues Arising From the Globalization Trend of New Energy and Environmental Protection

2.1.1 Why ESG

The manufacturing and production of new energy vehicles has become the most popular trend at present, and related car companies have frequently appeared on hot searches, which is enough to show that everyone is paying close attention to it. In recent years, China has also devoted itself to this wave of the times: the government has introduced a series of measures to escort the production and export of new energy vehicles; major companies have actively and innovatively developed, kept up with the forefront of the times, and supplied excellent automobile products. With the improvement of the Belt and Road policy, Southeast Asia has become China's main automobile export market. Among them, Indonesia has the closest cooperation with China. While meeting the interests and needs of the Indonesian people, China has also reaped a lot of economic returns. However, the development and export of new energy vehicles are not smooth sailing, and there will be setbacks on the road ahead. Risks accompany benefits, and opportunities bring challenges. How to solve these crises caused by social customs and economic interests will be the biggest problem facing the Chinese government, enterprises, and marketers. Therefore, whether we should analyse the new energy vehicle market and car manufacturing companies based on the three most important dimensions of environment, society, and governance under the trend of new era changes has become a very worthy issue to study. The concept of ESG provides a starting point for research. The ESG concept can be traced back to the "Who Cares Wins" report proposed by the United Nations in 2004. This report called for the inclusion of ESG factors in financial analysis and asset management for the first time. Subsequently, ESG standards quickly became an important measurement standard for the global capital market, especially in developed countries such as Europe and the United States. The theoretical discussion and practical application of ESG have been rapidly promoted around the world, forming a relatively complete research system and evaluation standards. Through the study of the three concepts, new viewpoints that fit the reality are proposed to help my country's new energy vehicle industry develop faster and better, promote the concept of global environmental protection, and promote the upgrading of the entire industry.

2.1.2 Why Indonesia

It is an indisputable fact that China is undoubtedly in the leading position in the world's new energy vehicle industry. Not only are there a hundred schools of thought in the new energy vehicle industry, but also excellent brands such as BYD, Ideal, and Weilai have been recognized by the world for their

technical strength and reputation. Looking at the entire automobile industry originated in Germany, and then many fuel vehicle brands were born in Europe, North America, and Japan and sold well all over the world. Objectively speaking, there is still a certain gap between the traditional domestic fuel vehicle brands such as Hongqi, Great Wall, Geely, and Chery since the founding of New China and other international brands. It can be said that China's automobile industry has officially embarked on the fast track since the new energy vehicle and has surpassed foreign brands from another more promising track in one fell swoop. Therefore, China's new energy vehicle industry has certainly become the most worthy of research. In addition to the domestic internal circulation, going abroad and going to the world is the only way for every mature car company. This has triggered our thinking: where should we go in the future?

The popularity of new energy vehicles depends on many factors, the most important of which are local oil prices, emission regulations, competitiveness of other brands, price and local economic development level, etc. At present, the domestic market has been well developed, and its feasibility has been verified. Africa may have certain difficulties due to its economic development level and infrastructure construction level. From the perspective of the European and American markets, the incremental growth of the entire automobile market has tended to be saturated, and it has to face the competition of strong local automobile brands, so it may also have certain difficulties. We consider Southeast Asia to be a good breakthrough. Most of its regions have serious environmental pollution, and the government intends to introduce relevant policies and measures to improve the environmental level. In recent years, international relations with China have been warming up, and the policy of foreign investment, such as investment and factory construction, is also relatively friendly. There is a lack of strong and competitive local brands—Japan's Toyota Honda and South Korea's Hyundai dominate. Therefore, if domestic new energy vehicle brands with high-cost performance, energy saving, environmental protection, low cost of use, stability, and reliability enter the competition with Japanese and Korean brands, they will become a strong opponent. Based on this, we roughly selected Southeast Asia as the basic research object.

Among the many Southeast Asian countries, such as Vietnam, Thailand, Myanmar, Indonesia, etc., which one should be used as the entry point? After conducting literature research and field research visits and discussions, we selected Indonesia as the research object. First of all, Jakarta, Indonesia, is the location of the ASEAN headquarters. We can use Indonesia as an anchor to create a successful market case and radiate to the entire Southeast Asian countries and regions. Secondly, as the largest consumer market for China's export of new energy vehicles in Southeast Asia, Indonesia has huge potential and serious environmental pollution problems. In addition, domestic car companies have achieved certain results in the local market through investment and factory construction. It is the most representative country. If it is selected as the research object, it can be used as a case to follow and promote in other Southeast Asian countries. It can achieve a win-win situation for both the local government and China's automobile companies, and in this way, it can also promote the good

development of international relations and trade between the two countries, which has a high research value.

2.1.3 Current Status of Research at Domestically and Externally

In today's era of deep integration of corporate development and social responsibility, the combination of ESG and corporate compliance is attracting widespread attention and in-depth discussion. The integration of the two is not accidental but conforms to the trend of global sustainable development and has collided with a wonderful "spark".

On the one hand, compliance plays an important role in the core guarantee of corporate sustainable development under the ESG standard. Within the ESG framework, corporate compliance means strictly abiding by relevant laws and regulations, industry standards, and ethical codes in all three dimensions. Compliance is the cornerstone for companies to practice the ESG concept. Through compliance testing, companies can be encouraged to operate more responsibly and thus build a new sustainable development model (Li, T. T., Wang, K., Sueyoshi, T. et al., 2021, p. 11663).

On the other hand, in the field of corporate compliance research, the ESG dimension provides a comprehensive and scientific evaluation perspective. ESG integrates theories such as sustainable development, economic externalities, and corporate social responsibility, prompting corporate compliance to shift from the traditional model to a comprehensive consideration of environmental, social, and governance factors (Huang, S. Z., 2021, pp. 3-10). Domestic-related research not only focuses on the relationship between ESG investment and corporate development but also notes that ESG compliance practices have built a basic framework for companies in terms of legal compliance, social responsibility fulfillment, and information disclosure (Yuan, R. L., Jiang, N., & Liu, M. Y., 2022, pp. 128-134; Mao, Q. R., 2025, pp. 137-140). In addition, ESG draws on previous concepts when constructing its concepts, and the quantifiable nature of its data and indicators evaluates corporate compliance more scientifically and effectively (Ka ź mierczak, M., 2022, p. 162).

Existing ESG compliance research mostly uses literature review, case analysis, and comparative research methods. By combining the development status of ESG compliance at home and abroad, analyzing the differences in regulations in different countries, and summarizing corporate practical experience, this paper explores the problems of ESG compliance in cross-border operations (Chen, Z., & Wang, S. Z., 2021, pp. 41-43; Li, C. J., & Sun, F. B., 2024, pp. 68-88).

Current research specifically addresses the three dimensions of ESG compliance, namely environment (E), society (S), and governance (G).

2.2 Environment

At present, the research methods on environmental compliance are diversified. In Chen Haisong's "Corporate Environmental Compliance and Legal Mechanism Construction under the 'Dual Carbon' Goal" [8], by combing the current status of corporate environmental compliance under the "dual carbon" goal from the perspective of legal mechanism construction, the fit between the existing legal system and corporate environmental compliance needs is analysed. The research path is to analyse the

current dilemma of corporate environmental compliance practice and combine relevant legal theories and practical experience at home and abroad to explore feasible paths to build and improve legal mechanisms. In "Legal Implementation Path of Corporate Environmental Compliance under the Background of 'Dual Carbon' Goals" (Zhang, Y. D., & Hua, H., 2023, pp. 54-56), Zhang Yedong and Hua Han take the "dual carbon" goal as the background from the perspective of the intersection of finance and law, study the legal implementation path of corporate environmental compliance under this goal, and explore effective legal protection methods by analysing the incentive and constraint mechanism of financial means on corporate environmental compliance.

Although research on environmental compliance has mainly focused on compliance issues in China, some studies have also focused on environmental compliance issues in Southeast Asia and Indonesia. Regarding Southeast Asia, scholars point out that Southeast Asian countries are in the process of continuous improvement in environmental protection laws, but the legal systems of some countries are not sound enough, and there are legal loopholes and lax enforcement. Chinese companies need to fully assess these risks when investing (Guo, Q. Y., & Qu, T., 2022, pp. 30-34; Liu, Y., 2018).

Compliance in Indonesia has made some progress. In his related research, Ling Yujie (Ling, Y. J., 2024) only took some provisions of Indonesia's Environmental Management Law and Water Resources Law as examples to briefly describe Indonesia's regulations on domestic energy investment and pollution discharge, and the overall review was not comprehensive enough. Liang Lini (2024) conducted a more in-depth study and sorted out Indonesia's environmental legal provisions, including comprehensive laws such as the Environmental Law and individual environmental laws such as the Mineral and Coal Mining Law and the Forest Law. She pointed out that Chinese companies investing in Indonesia face risks such as environmental access, impact assessment, regulation, and litigation, and proposed preventive measures such as improving the legal system, strictly approving companies, and improving environmental protection clauses in investment agreements before and during the operation of investment projects. Cao Shan (2021, pp. 20-24) sorted out Indonesia's automotive-related technical regulations system and analysed in detail the content and access certification process of luxury tax regulations and emission regulations, but mainly focused on automobile export products, did not pay attention to the manufacturing process of cross-border investment, and did not specifically involve new energy vehicles. In addition, regulatory information is also lagging. In summary, there are still many gaps in the comprehensiveness and timeliness of research in this field.

2.3 Society

Social compliance research is slightly narrower, mainly focusing on human capital and product responsibility.

In terms of research methods, Xia Qi, in his "Study on Legal Issues of Labor Risk Prevention in Chinese Enterprises' Overseas Farmland Investment" (Xia, Q., 2020), first sorted out relevant domestic and foreign literature to clarify the current research status, and then combined the cases of Chinese enterprises' overseas farmland investment and labour rights protection, such as illegal labour dispatch

cases, to deeply analyse the problems and put forward prevention suggestions, using a combination of literature analysis and case study methods. Liang Hao, in his "Study on Legal Risks and Countermeasures of Chinese Enterprises' Investment and Employment in Malaysia" (Liang, H., 2021), collected data on Chinese enterprises' overseas investment and labour disputes from multiple official websites, as well as data from Malaysian government websites for analysis, and also studied local labour dispute cases through case analysis, using a research method assisted by data statistics and empirical analysis.

Regarding environmental compliance, current research on social compliance issues mainly focuses on China, with only a few studies looking at cross-border investment and trade. In terms of human capital, studies have found that the labour law systems of Southeast Asian countries vary greatly, and some countries have weak law enforcement capabilities. Chinese companies face risks such as differences in labour standards and complex approval procedures. They have summarized human resource compliance into three aspects: compensation (working hours and benefits, contract termination), unions (organization and negotiation, strike risks), and local employment (Li, J., 2020). In terms of data compliance, scholars have pointed out that international data governance rules are in fierce competition, data laws and regulations of various countries conflict, and there are different regulations on data privacy and security requirements, data use and sharing restrictions, and emerging rights such as the right to know and the right to be forgotten (Liang, Y. N., 2023, pp. 81- 85). They have also proposed that companies should establish and improve data compliance management systems, risk identification, early warning mechanisms, etc., to deal with problems such as illegal data collection and use (Sun, Y. H., 2023, pp. 78-87). In terms of product liability, international economic research has only focused on cross-border e-commerce (Tang, L., 2023, pp. 143-145).

Currently, only a few scholars have conducted specific research on Indonesia. Liu Zeqing (Liu, Z. Q., 2022, pp. 68-70) mentioned that Indonesian law protects domestic workers and has strict restrictions on the use of foreign workers. Except for specific positions, domestic workers are used as much as possible. When employees leave, employers must pay severance pay or compensation, and workers who legally strike should receive wages. There is still a large gap in the research on compliance in Indonesian society.

2.4 Governance

Compliance issues in governance, scholars believe that the disclosure of internal governance ("G") information of new energy vehicle companies still needs to be improved overall: Chinese companies investing overseas should introduce international ESG standards and implement relevant disclosure items in practice, including establishing a corporate governance system that conforms to local conditions, clarifying the scope of authority of relevant organizations, and establishing an internal audit system and integrity compliance system. Scholars specifically collected the disclosure items and a number of governance disclosures of listed new energy vehicle companies. They concluded that the disclosure standards for governance information of new energy vehicle companies are single and

insufficient.

Regarding the issue of governance information disclosure, specifically in Indonesia, relevant scholars have summarized that according to the current Indonesian Company Law, new energy vehicle companies need to set aside a budget for social responsibility and prepare a special report for review and approval by the shareholders' meeting. Indonesia plans to adopt the International Financial Reporting Standards Sustainability Disclosure Standards (IFRS S1 and S2) in 2027 to better align with international standards. Studying international standards (IFRS S1 and S2) will be of great significance to corporate ESG compliance.

In general, existing research uses empirical research to analyse the ESG governance disclosure capabilities and performance of new energy vehicle companies and to explore the ESG compliance construction regulations in Indonesia. However, the current research still has the following problems: First, most of the research on the disclosure of new energy vehicle companies is in the field of economics, such as analysing the impact of automobile disclosure on the value of automobile companies. Few articles summarize and analyse the standardization of information disclosure from a legal perspective. Second, compliance construction is essentially a topic with strong territorial characteristics, so the corresponding analysis of the legal provisions of the research object country is of fundamental significance to compliance construction. However, there are currently few studies on Indonesia's ESG compliance construction regulations in China, and only some summarize several requirements, which are not very meaningful in practical guidance. Secondly, according to the development trend of regulations, Indonesia will adopt international financial reporting standards, but there are few domestic studies on Indonesia's regulatory changes. This article believes that with practicality as a guide, it specifically summarizes the regulatory requirements for the governance part of Indonesia's ESG and studies the new standards that Indonesia will adopt, providing a reference for new energy vehicle companies to further export to Indonesia.

3. Taking Reality as an Example—Case Analysis and Research

3.1 Taking BYD as an Example

The promotion of new energy vehicles has brought new vitality to Indonesia's automobile sales market. BYD, as a leader in China's new energy vehicle industry, is shining in the Southeast Asian market, including Indonesia. Opportunities accompany challenges. As more and more new energy vehicle companies enter the Southeast Asian market, if companies want to make profits, they have to consider how to combine the specific national conditions of the target countries, launch corresponding policies, and expand the foundation of win-win cooperation to the greatest extent. Let us take BYD as an example to see the whole picture.

3.1.1 BYD's Investment in New Energy Vehicles

3.1.1.1 Localized Production Layout

Since entering the Indonesian market, BYD has actively catered to the needs of the Indonesian market

and adjusted its own corporate plans. Among them, BYD plans to deepen its layout in the Indonesian market by building a local factory, but this move faces certain resistance. For example, in 2024, Indonesian media reported that BYD's factory construction had been "interfered by local organizations" (Pamela Sakina, 2024). The construction of the BYD factory in Subang, West Java, was once destroyed by a mass organization composed of thugs. At this point, car companies not only need to cater to the wishes of the local people but also rely on government support to ensure investment security. Active communication with the government is the best way to solve the problem. Fortunately, the Indonesian government's senior officials expressed support for foreign investment. Moeldoko, chairman of the Indonesian Electric Vehicle Industry Association in Jakarta, strongly supported the governor of West Java Province to eradicate thug behaviour that may interfere with investment and called for possible policy interventions (such as strengthening security and simplifying approval) to clear obstacles for BYD, reflecting that its investment strategy is highly consistent with Indonesia's new energy transformation goals.

3.1.1.2 Product Line Expansion of Automobile Companies

In order to enter the Southeast Asian market as quickly as possible, BYD launched a number of new energy vehicle models in Indonesia, including BYD Tang L EV (pure electric) and PHEV SUV, etc., with a starting price of approximately 534 million Indonesian rupiah (approximately RMB 250,000) (Adimas Raditya Fahky P., 2024). The pricing strategy of this type of product targets the mid-to-high-end market, targeting the middle-to-high-income population, and is committed to competing with international brands such as Tesla. In addition, BYD will also intensively launch new models between 2024 and 2025 to expand its target customer market, demonstrating its confidence in profitability in the Indonesian market and its determination to seize market share quickly.

3.1.2 Market Activity

3.1.2.1 Rapid Increase in Market Share

BYD is actively expanding its product competitiveness in the Indonesian market. Data from early 2025 showed that BYD has dominated the Indonesian new energy vehicle market (Pamela Sakina, 2024). BYD's ability to take the lead in the Indonesian market is mainly due to three aspects. First, in terms of price competitiveness, BYD and other Chinese brand cars have a natural advantage over European car brands. The majority of the working class is more willing to choose BYD's new energy vehicles with greater price advantages. Secondly, BYD enjoys policy dividends. Today, the wave of new energy vehicles is sweeping across countries, and naturally, Indonesia is not left behind. The Indonesian government has actively introduced relevant policies to reduce import taxes and value-added taxes on new energy vehicles, reduce terminal prices, and make it easier for foreign car companies to enter the market. Finally, BYD's SUV models are very much in line with the interests of the majority of Indonesian consumers. Consumers in the Indonesian market mostly choose to buy family cars. For this reason, BYD has taken the right remedy and gained a great advantage in the market.

3.1.2.2 Consumer Acceptance and Market Feedback

Chinese electric vehicles (including BYD) initially performed "positively" in the Indonesian market (Xinhua, 2024), reflecting consumers' increased acceptance of new energy technologies. From the time new energy vehicles were first introduced, they have gone from being questioned to being widely used today. This reflects not only the public's awareness of green energy but also the efforts of car companies to optimize, innovate, and launch well-received new products. However, judging from the current market response, insufficient charging infrastructure is still the main bottleneck. It is worth mentioning that the Indonesian government plans to increase the construction of charging piles, which will benefit BYD and other electric vehicle companies in the long run.

3.1.3 Energy Compliance Issues

3.1.3.1 Policy Compliance

BYD should plan to establish a factory in Indonesia further. At the same time, the Indonesian government requires foreign-funded automakers to gradually increase the proportion of local parts procurement (such as the "New Energy Vehicle Roadmap"). BYD's factory construction can not only meet compliance requirements but also reduce tariff costs, which will help promote the export of new domestic energy vehicles.

3.1.3.2 Social and Political Risks

At present, BYD still needs to pay the most attention to the interference of local organizations. During the construction of the factory, it encountered interference from informal organizations, which needed to be resolved through government coordination. Indonesia's business environment is complex, and automakers need to communicate with all parties to ensure smooth factory construction actively. As some regions still have protectionist tendencies, how to market and public relations is still a difficult problem facing BYD.

3.1.4 Challenges and Prospects

Although BYD has taken the lead in the Indonesian new energy vehicle market with its combination of localized production + product diversification + policy response, it still needs to deal with multiple challenges: lagging infrastructure (inadequate charging network coverage may restrict sales growth), intensified local competition (such as Wuling and Hyundai joint ventures accelerating new energy layout) and policy volatility risks (the Indonesian government may adjust its subsidy policy to affect market stability). However, the long-term prospects of the Indonesian market are still broad - the government plans to achieve a 25% share of new energy vehicles by 2030, and the market size is expected to exceed one million vehicles; at the same time, Indonesia's rich nickel ore resources provide BYD with opportunities for industrial chain synergy in localizing battery production and further reducing costs. In addition, as the largest economy in Southeast Asia, Indonesia has significant geostrategic significance and can become a key springboard for BYD to radiate the ASEAN market. In the future, BYD needs to continue to strengthen infrastructure cooperation, deepen localized compliance operations, and avoid political risks to consolidate its first-mover advantage and achieve

sustainable growth (Fathur Rochman, 2024).

3.2 Case Comparison Based on Toyota Investment in Japan

As a leading Japanese automaker, Toyota has been the best-selling car brand in Indonesia since 1997 and is a representative research object. In recent years, despite the pressure brought by the development of new energy vehicles and the transformation and upgrading of its industry, Toyota still occupies a huge market share in Indonesia. In 2023, Toyota's wholesale sales of automobiles in Indonesia reached approximately 336,777 units, accounting for 33.5% of the market share, ranking first in the market. In 2024, despite the overall market decline, Toyota still maintained its leading position with a market share of 33.4% (Matt Gasnier, 2024). In the first quarter of 2025, Toyota continued to occupy a market share of 34.6%, with sales of 46,479 units. Among them, Kijang Innova (produced by Toyota) became the best-selling model in Indonesia in 2023 and 2024.

Toyota's investment in Indonesia is also a process of continuous localization, capacity expansion, and market share expansion. Through localized production layout and other investment methods, Toyota has been able to sit on the throne of sales champion in Indonesia and even Southeast Asia for a long time.

3.2.1 Deep Localization Model

The Indonesian government has long been promoting a localization policy for the automotive industry, requiring automakers to increase the proportion of local parts used in order to obtain tax incentives. For Toyota, localized production may be a challenge to a certain extent, but it also brings more opportunities from external factors.

Since establishing PT Toyota-Astra Motor (TAM) in 1971 as a joint venture with Indonesian companies, Toyota has gradually deepened its local production in Indonesia. In 2003, Toyota separated its manufacturing function and established PT Toyota Motor Manufacturing Indonesia (TMMIN), focusing on the local production of complete vehicles and engines. Currently, TMMIN operates multiple factories in Sunter and Karawang, with an annual output of 278,141 vehicles. Its products not only meet domestic demand but are also exported to ASEAN and other regions.

In addition, Toyota is also actively promoting the localization of its supply chain in Indonesia. According to Indonesian media reports, by 2024, Toyota will have cooperated with about 200 first-tier suppliers, covering the local production of about 10,000 parts, and Toyota Indonesia's facilities will be spread all over Indonesia. For example, the utilization rate of local parts for Kijang Innova is 85%, Sienta is 80%, and the localization rate of other models such as Vios, Yaris, and Fortuner is also above 75%. At the same time, Toyota also continuously improves the manufacturing capabilities and quality standards of local suppliers through training programs such as the "Jishuken Toyota Production System" and strictly controls the supply quality to ensure that the car can form an advantage even if it is produced locally in Indonesia.

It can be seen that in order to meet these policies, Toyota has continuously adjusted its supply chain and increased local procurement and production, which may pose a challenge to its global unified

production system in the process of turning to localized production. However, Toyota has found a localization strategy that suits itself. Through joint ventures with local and multinational companies, it has not only established a strong sales and service network but also localized production and supply chains, reduced costs, and increased market response speed. Therefore, Toyota's success in Indonesia is inseparable from its deep localization strategy.

3.2.2 Product Diversification and Market Segmentation

If a company wants to gain a foothold in the market, it must make its products meet the economic capabilities and actual needs of local consumers. In a large market like Indonesia, where there are obvious differences in economic development levels and consumption capabilities, a single-product strategy makes it difficult to maintain the long-term advantages of the brand. Toyota is well aware of this and has launched a diversified product line, from economy cars to high-end SUVs to hybrid models, to meet the needs of consumers of different classes, regions, and purposes and achieve precise investment.

As early as 1977, Toyota officially launched the Toyota Kijang in Jakarta, a multi-purpose commercial vehicle designed specifically for the Indonesian market. Since then, Toyota has continuously invested in and improved the vehicle configuration according to actual conditions, highly covering the main vehicle usage scenarios in the Indonesian market. From the entry-level microcar Agya, the small MPV Calya, to the mid-range family car Avanza and Kijang Innova, to the mid-to-high-end SUVs such as Fortuner and Rush, and even the Alphard and Vellfire for high-end business travel, Toyota has a mature product investment layout in almost all market segments, which not only increases its market share but also allows consumers to continue to trust and choose Toyota in the process of upgrading and changing cars, making it less likely to lose to other brands.

At the same time, Toyota also made systematic localized adjustments to Indonesia's road conditions, climate conditions, and family structure when investing. For example, in response to the narrow roads and many potholes in Java Island and Sumatra, Toyota equipped its MPVs and SUVs with higher chassis and flexible suspension systems; in response to Indonesia's humid and rainy tropical climate, Toyota strengthened the power and dehumidification efficiency of the air-conditioning system; in order to adapt to the collective travel characteristics of multiple generations living together in Indonesia, Toyota mostly adopts a 7-seat or 8-seat design in terms of vehicle seat layout to maximize the flexibility and carrying capacity of the interior space. In addition, Toyota cars are characterized by low prices, fuel efficiency, and durability, which constitute the basic plate of its investment competition in the local market.

3.2.3 Policy Adaptation and Government-Enterprise Cooperation

In an emerging market like Indonesia, which is highly dependent on policy-oriented development, foreign automakers must not only win over consumers but also the government if they want to invest and gain a foothold here for a long time. Since Japanese brands entered the Indonesian market relatively early, they already have a deep user base in Indonesia. Japanese automakers are familiar with

Indonesia's policies on investment and have established extensive cooperative relations with the local government, influencing local automotive industry standards and policy formulation.

Since the 1990s, the Indonesian government has been implementing a "localization incentive policy" that requires automakers to gradually increase the use of local parts in exchange for lower import tariffs and luxury goods sales tax (PPnBM) benefits. This policy has created a high threshold for brands that are unwilling to invest locally and rely on imported parts, but for Toyota, which has already deeply cultivated the local market and established a mature production system, it is an opportunity to expand its cost advantage further.

Toyota has sufficient flexibility and foresight in adapting to local automotive industry policies. When Indonesia introduced policies related to localized production, it expanded local assembly plants to meet the requirements of localization of vehicles. It actively linked up with upstream parts companies to promote the localization of the supply chain. This makes Toyota sufficiently competitive in terms of price, and it can control costs well even when facing the impact of low-priced products from Chinese brands or other automakers.

Faced with the Indonesian government's policy orientation of vigorously developing the electric vehicle industry since 2020, Toyota not only did not avoid the challenge but actively embraced the transformation and strived for the initiative. During the policy transition period of new energy vehicles, although the pace of the electrification transformation of Japanese cars was slightly slower, Toyota still responded strategically quickly. In July 2022, after Indonesian President Joko Widodo visited Japan, Indonesia immediately stated that Toyota plans to invest 27.1 trillion rupiah (about 1.8 billion US dollars) in Indonesia in the next five years to produce electric vehicles (Gayatri Suroyo, 2022). In addition, Toyota also plans to build a new battery assembly plant to support electric vehicle production in Indonesia.

At the same time, Toyota has established close cooperation with the Indonesian government in many aspects during its decades of deep cultivation in Indonesia. For example, in 2023, the Indonesian Ministry of Industry and Toyota Motor Manufacturing Indonesia (TMMIN) jointly held a seminar on the theme of promoting the digital transformation of Industry 4.0 in the automotive industry. Toyota has also actively participated in the formulation of automotive industry standards and policies. In the "Low-Cost Green Car" (LCGC) policy launched by the government, Toyota was one of the first companies to respond and launch models that met the policy, investing in the Agya model to meet the needs of encouraging the production of low-cost, energy-saving and environmentally friendly cars. In the Southeast Asian market, with economic uncertainty and frequent policy changes, Toyota did not stick to tradition but actively transformed its foreign investment role into a local partner or even a policy promoter. This high degree of local adaptability and cooperative spirit not only ensures that Toyota enjoys the policy dividends of the Indonesian government and expands its first-mover advantage in investment but also enables it to shape a positive image at the government level and enhance its risk resistance.

3.3 From Traditional Car Companies To New Energy: A Cross-Generational Comparison of BYD and Toyota's Investment in Indonesia

By comparing the investment cases of two well-known car companies in Indonesia, it is not difficult to see that BYD, as a leading new energy car company, has a high degree of similarity in investment strategy with Toyota even though it invested in the Indonesian market relatively late. This shows that Toyota's path of deepening its presence in the Indonesian market is correct and worth learning. However, as an emerging industry, new energy car companies have their unique advantages and challenges when investing.

BYD's investment in Indonesia has a significant competitive advantage, largely due to its ability to control costs and integrate the industrial chain, that is, by building its core component systems, such as batteries, motors, and electronic controls, to reduce dependence on external suppliers, thereby effectively controlling production costs and improving efficiency. BYD produces its blade batteries and self-developed electronic control systems and has even entered the field of automotive-grade chips, which makes it fully independent in the core technical aspects of new energy vehicles, not only saving procurement costs but also giving it higher investment and production stability and flexibility in the context of tight international supply chains.

BYD has also chosen a similar investment path as Toyota, that is, to achieve localized production as much as possible. In a resource-rich country like Indonesia, where the industrial system is still developing, just as Toyota has achieved supply chain localization through joint ventures, Chinese new energy vehicle companies can also take advantage of their strong upstream resource integration capabilities and technologies. China is a global leader in battery raw material processing, with more than 60% of the world's lithium, cobalt, and graphite processing capabilities. BYD and other automakers can rely on the country's strong domestic battery industry chain to attract upstream and downstream industries to invest in the Indonesian market as related industries expand their investment in Indonesia, the battery and precursor supply chain has gradually improved, laying the foundation for Chinese new energy vehicle companies to localize vehicle production. Indonesia has the world's largest reserves of laterite nickel ore, and Chinese automakers have already made arrangements in advance through investment and joint ventures. For example, in recent years, companies such as CATL have invested in and built factories in areas rich in nickel resources in Indonesia, cooperated with local governments and enterprises to develop laterite nickel ore, and set up smelting facilities and battery material factories on-site. In April 2022, CATL invested approximately US$6 billion to establish a joint venture with Indonesia's ANTAM and IBI to build a full-power battery industry chain project. Chinese new energy vehicle companies can, therefore, directly connect with local battery suppliers such as CATL, forming a virtuous cycle of local resource processing and local product production.

New energy vehicle companies have rich policy dividends in the context of encouraging green development today and can enjoy many preferential policies and subsidies at the government level. At the national level, the Indonesian government is vigorously promoting the development of new energy

vehicles, proposing that by 2025, the sales of electric vehicles (EVs) will account for 20% or about 340,000 vehicles and that all vehicles sold will be electric vehicles by 2050. At the same time, the Indonesian government also announced in 2019 that the government would provide various fiscal and non-fiscal incentives to related companies to promote the development of the local pure electric vehicle industry, which has brought strong policy impetus to the investment and development of Chinese new energy vehicle companies in Indonesia.

However, if Chinese new energy vehicle companies want to achieve long-term investment and development in Indonesia, there are still many problems and challenges that need to be solved. Indonesia's charging infrastructure is not yet perfect, and a comprehensive coverage layout has not yet been formed, which limits the promotion of electric vehicles. Compared with traditional car companies such as Toyota, which have been deeply rooted in Indonesia for decades and have almost monopolized the Indonesian automobile market, Chinese new energy vehicle companies have low brand awareness in Indonesia, and consumers' acceptance and trust in new brands need time to cultivate. In addition, it also takes time and resources to establish a complete supply chain system and after-sales service network in overseas markets. Chinese new energy vehicle companies also need to focus on cultivating local suppliers and service partners to ensure product quality and customer satisfaction, thereby laying a solid foundation for long-term investment and development in the Indonesian market.

4. Research Guidelines Based On the Legal Aspect

ESG is a reference indicator for evaluating investment targets. It evaluates the sustainability and social impact of companies through their performance in the three dimensions of "environment, society, and governance," thereby influencing investors' investment decisions. Specifically, it requires companies to "create value for shareholders and make profits while assuming responsibilities to stakeholders such as employees, consumers, the environment, and the community" (Li, S., & Huang, S. Z., 2022, pp. 13-25). At present, ESG, a concept originally belonging to the scope of economics, is gradually entering the legal field. Through legal provisions, society's understanding of this concept is further strengthened, and it is gradually transformed from a soft indicator into a mandatory regulation. At present, the degree of inclusion of ESG in the laws of various countries in the international community is different. Generally speaking, there are three approaches. The first is to directly formulate ESG-related regulations and directly stipulate the relevant content of ESG governance through a whole set of specific regulations. The typical representative of this model is the European Union. As a leading representative of ESG governance, the European Union formulated the relevant laws and regulations on ESG, the Non-Financial Reporting Directive (NFRD), as early as 2014. Subsequently, the Corporate Sustainability Reporting Directive (Directive (EU) 2022/2464, "CSRD") and the Corporate Sustainability Due Diligence Directive (Directive (EU) 2024/1760, "CS3D") were passed in 2022 and 2024. After the two directives come into effect, they will replace the Non-Financial Reporting Directive issued in 2014. At the beginning of 2025, the European Commission proposed major revisions to ESG

regulations such as CSRD and CS3D.

In general, the main contents of the EU ESG regulations include the following: firstly, Information disclosure is a core obligation. The regulations clarify the unified disclosure standards and require relevant companies to disclose information related to environmental, social, governance, and other sustainable development by the relevant requirements of the European Sustainability Reporting Standards ("ESRS"); secondly, Due diligence is another core obligation. This obligation includes but is not limited to investigating whether there are actual and potential adverse effects on labour rights and the environment in the operation of itself, its subsidiaries, and business partners related to its value chain, whether measures to mitigate such adverse effects are taken, and timely publishing of investigation reports. The second type is that although no special ESG regulations have been established, the ESG concept has been absorbed into various departmental laws. Most of the issues contained in ESG have been covered by laws and regulations in various fields and are scattered in relevant legal provisions to jointly promote the sustainable development of enterprises, such as China and Indonesia. For example, Article 20 of the Company Law of the People's Republic of China stipulates that "when a company engages in business activities, it shall fully consider the interests of stakeholders such as company employees and consumers, as well as social public interests such as ecological and environmental protection, and assume social responsibilities," which is an important manifestation of the inclusion of the ESG concept in company law. The issues related to organizational structure, shareholder rights, information disclosure, etc., are all covered by the Company Law, the Measures for the Administration of Information Disclosure of Listed Companies, the Anti-Unfair Competition Law, and other laws and regulations. In terms of the protection of workers' rights and interests, the labour law system with the Labor Law and the Labor Contract Law as the core is an important legal support for China to implement the protection of workers' rights and interests. The third type has both ESG-specific legislation and regulations formulated for different fields, forming a "one core - multiple levels" governance system, such as the European Union. In addition to the mandatory disclosure regulations mentioned above that directly implement ESG, the European Union has also promulgated the "Batteries and Waste Batteries Regulations" and other regulations related to ESG governance, which together constitute the ESG governance system.

Compliance review of corporate ESG refers to the compliance check of the legal norms of various elements included in the three dimensions of environment, society, and corporate governance under the aforementioned legal regulations, as well as the legal compliance review of ESG special legislation.

Indonesia, the research object of this topic, adopts the second ESG legislative model; that is, there is no direct ESG governance law, but the various departmental laws together constitute the legislative norms of ESG governance as the norms for corporate sustainable development. The relevant provisions will be elaborated in detail from various angles below, and we are committed to providing compliance guidance for new energy vehicle companies to develop their business in Indonesia.

4.1 Mandatory Disclosure System

In terms of the construction of the ESG mandatory disclosure system, Indonesia's current regulatory system shows obvious structural differences. The country has only made relatively detailed provisions on the ESG disclosure obligations of listed companies and financial institutions and only given relatively general principled requirements for non-listed companies involved in natural resources. Compared with the relatively complete ESG regulatory systems of the European Union and China, there is still a certain gap in the breadth of system coverage and the depth of implementation details. Based on this, this article will classify and interpret Indonesia's ESG mandatory disclosure system by subject type and briefly discuss some non-mandatory disclosure practices. Given that this article focuses on compliance issues in the new energy vehicle industry, the first part will focus on analysing the relevant regulations for listed companies and will not involve the ESG disclosure requirements of financial institutions for the time being.

4.1.1 Mandatory Disclosure Obligations of Listed Companies

Indonesia mainly focuses on "sustainable finance" through the Regulation on the Implementation of Sustainable Finance by Financial Services Institutions, Issuers and Listed Companies (OJK Regulation No. 51/2017) ("Regulation 51/2017"), which makes general provisions on the mandatory disclosure obligations of listed companies and states that "Financial Services Institutions, Issuers and Listed Companies are obliged to prepare a 'Sustainable Development Report' ('Report')".

First, in terms of the scope of the subject, the term "listed company" in Regulation 51/201 in Indonesia refers to "a joint-stock company whose shares are held by at least 300 shareholders and whose paid-in capital is at least 3 billion rupiah, or whose number of shareholders and paid-in capital meet government regulations." Secondly, there are two ways to submit the report: it can be prepared separately or as an integral part of the annual report, and it needs to be made public on the official website or in a media that is easily accessible to the public.

Subsequently, Indonesia made further specific provisions in the Notice on the Form and Content of Annual Reports of Issuers and Listed Companies (OJK No. 16/2021) ("Notice 16/2021"). The report should at least include sustainable strategy; the company's efforts in sustainable development (economic, social, and environmental); sustainable development governance; sustainable development performance; written inspection opinions of independent institutions on the report and its contents (if any); reader feedback (if any); the company's response to feedback in the previous year's report, etc.

Compared with the mandatory ESG disclosure system for listed companies in other countries or international organizations, the relevant provisions in Indonesia are more general and have not yet made clear definitions of key elements such as the classification method, accounting boundaries, and accounting methods of disclosed data. This makes companies face many judgment difficulties in the actual disclosure process. For example, in the accounting of greenhouse gas emissions, it is difficult to determine whether the calculation scope should cover the scope of three emissions specified in IFRS S2; in terms of accounting boundaries, how to include emissions from joint ventures and emissions

from indirectly controlled facilities of enterprises in the calculation; in terms of environmental information disclosure issues, whether the use of marine resources and raw material consumption should be disclosed, there is a lack of clear guidance.

In this regard, Regulation 51/2017 only puts forward the principle suggestion that "in addition to the minimum standards, companies can also disclose information in accordance with international standards." In practice, many Indonesian companies choose to use the Global Reporting Initiative (GRI Standards) as the basis for proactively disclosing ESG reports. However, Indonesia has not yet formally adopted any specific international standards. For listed new energy vehicle companies, when fulfilling their ESG disclosure obligations, they need to pay close attention to the dynamic updates of relevant Indonesian laws and regulations to avoid compliance risks caused by changes in rules.

4.1.2 Mandatory Disclosure Obligations for Non-Listed Companies Involved In Natural Resources

Indonesia has set out mandatory ESG disclosure obligations for companies involved in natural resources in Regulation No. 47 of 2012 on Corporate Social and Environmental Responsibility ("Regulation 47/2012"). The Regulation stipulates that companies that conduct business activities in the areas prescribed by law or in areas related to natural resources are obliged to assume social and environmental responsibilities. Among them, "companies that conduct business activities in areas related to natural resources" refer to companies that do not directly manage or use natural resources but whose business activities affect the functions of natural resources (including environmental protection functions). The new energy vehicle manufacturing industry involves battery production, parts processing, and other links. Its upstream supply chain is closely dependent on the mining and utilization of mineral resources such as lithium, cobalt, and nickel, and the development of mineral resources is directly related to the protection and sustainability of natural ecosystems. Therefore, due to its dependence on natural resources and potential environmental impact, the new energy vehicle manufacturing industry belongs to the "companies that conduct business activities in areas related to natural resources" defined in Regulation 47/2012 and must perform ESG information disclosure and social and environmental responsibilities by the Regulation.

According to Regulation 47/2012, the way to assume social and environmental responsibilities is to record the relevant content in the company's annual work plan, which shall be performed by the board of directors, and its performance shall be included in the company's annual report and reported to the shareholders' meeting. However, due to the early promulgation of this Regulation, compared with the subsequent Regulation 51/2017 and Announcement 16/2021, its content is relatively preliminary, and the provisions are relatively general. It neither clarifies the standards and formats for the implementation of the report nor defines the necessary information for the report. In actual operation, the report usually covers the specific content of the three dimensions of environment, society, and governance. Even so, unlisted new energy vehicle companies still need to pay attention to the mandatory disclosure obligations stipulated in this Regulation. After all, Indonesia may subsequently introduce new regulations or announcements to refine and improve the relevant requirements.

4.2 Environment (E)

In the field of environmental compliance, new energy vehicle companies going overseas to Indonesia need to focus on a series of regulations and standards. Among them, the regulations related to the Environmental Impact Analysis Report (AMDAL) are related to the environmental risk assessment of the project; the Indonesian Green Industry Standard (SIH) clarifies the green requirements of the company's production process; and the "Regulations on the Collection of Luxury Sales Tax on Luxury Motor Vehicles" involves environmental protection-related tax policies. These three types of regulations will be elaborated in detail later.

4.2.1 Regulations Related To Environmental Impact Analysis Report (AMDAL)

In the Indonesian Environmental Impact Analysis Report (AMDAL) system, three core regulations have a key impact on the project construction and operation of new energy vehicle companies.

First of all, Law No. 32 of 2009 (Environmental Protection and Management Law) is the basic framework regulation for environmental management in Indonesia. It clarifies the importance of environmental impact assessment (AMDAL) and stipulates that any business project that may have a significant impact on the environment must carry out AMDAL.

For the new energy vehicle industry, there are significant environmental risks in the battery manufacturing process. Taking hydrometallurgical technology as an example, the heavy metal pollution it produces can easily reach the regulatory bottom line. Therefore, AMDAL has become a necessary procedure for new energy vehicle companies before launching projects.

According to Law No. 11 of 2020 (Employment Creation Law) and its implementing regulations, the implementation procedures of AMDAL have been optimized. On the one hand, the regulations clarify the environmental impact assessment obligations and exemptions of specific enterprises and exempt some small projects or developments located in non-sensitive areas from AMDAL requirements; on the other hand, they promote the integration of environmental impact assessment documents with other licenses, simplify the approval process to reduce the burden on enterprises and strengthen the supervision mechanism after project operation.

What automakers need to focus on is Government Regulation No. 22 of 2021 (Environmental Protection and Management Regulation), which focuses on refining the technical specifications and implementation process of AMDAL and clarifies that AMDAL needs to pass several technical approvals, including technical approval of exhaust emission quality standards (Pertek Pemenuhan Baku Mutu Emisi), Traffic Impact Analysis Technical Approval (ANDALALIN), Wastewater Quality Standard Technical Approval (IPAL), and Hazardous and Toxic Substances Management Technical Approval (Pertek Pengelolaan Limbah B3).

In addition, the AMDAL system also requires companies to not only pass the approval and meet the standards but also to formulate a comprehensive waste treatment and emission control plan and be equipped with professionally trained pollution prevention and control personnel. New energy vehicle companies must attach great importance to AMDAL compliance. If they fail to pass the law, they will

face a high fine of up to 5 billion rupiah (about 2.25 million yuan).

4.2.2 Green Industry Standard (SIH)

According to the requirements of Government Regulation No. 28 of 2021, manufacturing companies must comply with the green industry standards issued by the Indonesian Ministry of Industry, which covers a wide range of industries. The green industry standards for new energy vehicle manufacturing include but are not limited to flat glass green industry standards, safety glass green industry standards, steel plate green industry standards, etc. The most important of these is the green industry standards for parts and accessories for four-wheeled or above motor vehicles. Green industry standards mainly include technical requirements and management requirements. This article mainly summarizes its technical requirements.

Table 1. Technical Requirements for Green Industry Standards for Parts and Accessories for Four-Wheeled and Above Motor Vehicles (Mufflers)

Aspect	Standard	Limit	Verification Method
Raw Materials	1.2 Raw material sources 1.3 Raw material processing procedures 1.4 Product and raw material usage ratio	Proof of the source of raw materials for each batch of production (such as inspection sheet) must be provided; Raw materials must pass laboratory testing and do not contain cadmium, lead, mercury, chromium, or asbestos. Develop and implement SOPs and IKs (Work Instructions) for raw material handling. Product and raw material usage ratio ≥ 92.5% (calculated based on the data of the past year)	Verify the raw material inspection sheet for each batch of production; Verify the laboratory test report (including CoA, SDS) provided by the supplier - Check SOP/IK documents and on-site implementation Calculate the ratio: $R_{PB} = \frac{P}{B} \times 100\%$ (P = product output, B = raw material usage)
Energy	Power consumption per unit	≤70 kWh / ton of product	Verify the electricity consumption data and actual output for the past year Calculation: $K_{ELP} = \frac{K_{EL}}{P} X$ (K_{EL} = electricity consumption, P = product output)
Production Process	Overall Equipment Effectiveness (OEE)	≥97%	Verify the planned production time, actual production time, ideal operation rate, and qualified product quantity in the past year Calculation: OEE = Availability (AI) × Performance Efficiency (PPI) × Quality Efficiency (QPI)
Product	Product	Comply with SNI 8443:2017	Verify SPPT-SNI certificate, laboratory test report

	Quality	standard or customer requirements	
Package	Primary packaging: Plastic Secondary packaging: carton	At least 25% recycled plastic used in packaging	Verify recycled plastic use records and declaration documents
Waste	6.1 Wastewater treatment facilities 6.2 Wastewater parameters meet standards 6.3 Waste gas treatment facilities 6.4 Solid Waste Recycling 6.5 Hazardous and toxic waste (B3) treatment 6.6 Solid Waste Management Plan	Possess IPAL (wastewater treatment facility) and IPLC (discharge permit); Wastewater meets environmental quality standards; Equipped with waste gas treatment facilities; Recycling of solid waste (such as production waste); Hazardous and toxic waste is handled by a licensed third party; Implement approved solid waste management plans	Verify IPAL/IPLC documentation and facility operation status accredited): Check waste disposal records and compliance
Greenhouse gas emissions	CO_2 emissions	≤50.75 kg CO_2 / ton of product	Verify energy usage data and emission factor calculation (Formula: $CO_{2_{emissions}} = activity\ data \times emission\ factor$)

From the above technical requirements, the Indonesian green industrial standard covers the entire process of the control of the parts and accessories industry (mufflers) of four-wheeled and above motor vehicles in the manufacturing of new energy vehicles. In the raw material link, strict traceability of sources and restriction of harmful substances are aimed at reducing pollution risks from the source; the setting of energy consumption standards encourages enterprises to improve energy efficiency and promote the transformation of the industry to low carbon. In terms of production technology, high requirements for the comprehensive efficiency of equipment not only ensure the stability and efficiency

of production but also reduce additional resource consumption and pollution emissions caused by equipment failures.

Product quality is based on national standards or customer requirements to ensure the quality and safety of products circulating in the market; the proportion of recycled plastics used in packaging materials is in line with the concept of circular economy and helps reduce plastic pollution. The multi-dimensional requirements for waste treatment have established a comprehensive pollution prevention and control system, and standardized management has been achieved from wastewater and waste gas to solid waste and hazardous waste. The clarification of greenhouse gas emission limits directly responds to global climate governance goals, prompting companies to optimize energy structures and improve technical processes during the production process to meet increasingly stringent environmental protection requirements. For new energy vehicle companies going to Indonesia, the full implementation of these technical requirements is not only a necessary measure to meet local regulations but also a key path to enhance the green competitiveness of enterprises and achieve sustainable development.

4.2.3 Regulations on the Collection of Luxury Goods Sales Tax on Luxury Motor Vehicles and Its Amendments

Government Regulation No. 73 of 2019, "Regulations on the Collection of Luxury Sales Tax on Luxury Motor Vehicles," was revised by Government Regulation No. 74 of 2021 to build a more sophisticated and complex tax system. The new regulations use core parameters such as vehicle model, power technology type (pure electric, fuel, hybrid), and carbon dioxide emissions as anchors and set differentiated tax rates and tax calculation standards for different types of motor vehicles, with significant differences in tax burdens at all levels. This policy adjustment not only directly affects the cost structure and market pricing strategy of automakers but also implies the Indonesian government's strategic intention to promote the green transformation of the automotive industry. For new energy vehicle companies going to Indonesia, accurately grasping the subtle changes in these tax standards is the key to optimizing operating costs and improving market competitiveness, and requires continued high attention.

Table 2. Luxury Sales Tax Rates and Tax Calculation Standards for Electric or Hybrid Vehicles

Model/ Technology	**Passenger capacity or number of wheels**	**Cylinder capacity (cc)**	**CO_2 emissions (g/km)**	**Tax rates and tax calculation standards**	**Related Terms**
Electric Vehicles	10-15 (including driver)	\	\	15%	Article 17 of 19
	Double-cab vehicle			10%	
Vehicles using battery electric	Four-wheel vehicle	\	≤100	15% (tax base is 0% of sales	Article 35 of 2019, revised

(BEV) or fuel cell (FCEV) technology			price)	in 2021
Vehicles with plug-in hybrid electric technology (PHEV)	\	≤100	15% (tax base is 33 ⅓ % of the sales price)	Newly added as Article 36A in 2021
Full Hybrid	≤1200 (gasoline); ≤1500 (diesel/semi-diesel)	≤120	15% (the tax base is 20% of the sales price)	Article 25 of 19
		<100	15% (tax base is 40% of the sales price)	Article 26 of 2019, revised in 2021
	≤ 3000	100-125	15% (the tax base is 46 $^{2}/_{3}$ % of the sales price)	Article 27 of 2019, revised in 2021
		125-150	15% (the tax base is 53 ⅓ % of the sales price)	Article 28 of 19
Mild Hybrid	≤3000	<100	15% (the tax base is 53 ⅓ % of the sales price)	Article 29 of 19
		100-125	15% (the tax base is 66 ⅓ % of the sales price)	Article 30 of 19
		125-150	15% (the tax base is 80% of the sales price)	Article 31 of 19
Full hybrid or mild hybrid vehicle	＞3000 and ≤4000	<100	20%	Article 32 of 19
		100-125	25%	Article 33 of 19
		125-150	30%	Article 34 of 19

From the above regulations and their revisions, Indonesia's luxury sales tax on new energy vehicles presents a distinct policy orientation and dynamic adjustment characteristics. On the one hand, the tax rate and tax calculation standard are closely related to core indicators such as vehicle technology type, passenger capacity, cylinder capacity, and CO_2 emissions, aiming to encourage enterprises to transform to low-emission and high-efficiency electrification technology through tax leverage. For example, pure electric vehicles, with the advantage of zero tail gas emissions, obtain relatively preferential tax rate policies in specific vehicle classifications, while hybrid vehicles are subject to differentiated tax calculation bases based on their emissions and power performance, which fully reflects the precise regulation of tax policies on environmental protection technologies.

On the other hand, the special provisions of Article 36B highlight the Indonesian government's determination to promote the development of the battery electric vehicle industry. With the achievement of the 5 trillion Rupiah investment target and the start of commercial production, the adjustment of the tax base of relevant models has reduced the tax burden for enterprises in the short term, helped attract more capital investment, and accelerated the scale-up process of the industry. However, car companies should also be wary of policy time limits. The above-mentioned tax regulations on hybrid vehicles will expire on October 15, 2029, which means that the tax policy for new energy vehicles in the future is very likely to usher in a new round of changes. Therefore, new energy vehicle companies going overseas to Indonesia should not only accurately grasp the current tax preferential policies and optimize product layout and pricing strategies but also establish a dynamic policy tracking mechanism to judge the trend of regulatory adjustments in advance to cope with possible changes in tax policies in the future and ensure the long-term compliance and sustainable development of enterprises in the Indonesian market.

4.3 Society (S)

Combining the previous review and the specific situation of Indonesian legislation, this article analyzes the requirements of Indonesian laws and regulations on social (S) factors in ESG from three aspects: employee rights protection, community relations, and social and religious culture.

4.3.1 Protection of Employee Rights and Interests

Labor Law (2003), the Government Regulation No. 2 of 2022 on Job Creation ("Law No. 6 of 2023", hereinafter referred to as the "Job Creation Regulation"), and the Regulation on Fixed-Term Employment, Outsourcing, Working Hours and Rest Times, and Employment Termination (2021). This article mainly emphasizes the company's protection of employee rights and interests from the aspects of working hours, wage requirements, layoff requirements, and employee localization protection, as well as the social responsibility of respecting local religious customs.

4.3.1.1 Working Hours and Salary Regulations

The Labor Law and the Regulations on Creating Employment Opportunities stipulate that employees' working hours shall not exceed 40 hours per week. The monthly salary of workers shall not be lower than the "provincial minimum wage standard" of the place where they are located.

In addition, the law strictly restricts the conditions for overtime work. The Labor Law and the Regulations on Creating Employment Opportunities stipulate that overtime work must be agreed to by the workers that overtime work may not exceed 4 hours per day, and the cumulative overtime time per week may not exceed 18 hours. Overtime pay must be paid, and there is a detailed calculation method for overtime pay.

For overtime on weekdays: a. The first hour of overtime on a weekday is 1.5 times the hourly wage; b. Each subsequent hour of overtime is 2 times the hourly wage;

Overtime on rest days or statutory holidays: a. Overtime pay for the first to eighth hours is paid at twice the hourly wage; b. Overtime pay for the ninth hour is paid at three times the hourly wage; c. Overtime pay for the tenth to twelfth hours is paid at four times the hourly wage.

The Regulations on Fixed-Term Employment Contracts, Outsourcing, Working and Rest Time, and Termination of Employment Relations additionally grant companies the right not to pay overtime to certain personnel. Management personnel do not need to pay overtime because of their flexible working hours and generous salaries. Companies can make specific provisions for the above positions through labour contracts, collective contracts, and rules and regulations.

Regarding holiday regulations, the Labor Law and the Regulations on Job Creation provide that employees who have worked for 12 months are entitled to 12 days of paid annual leave. Among them, Muslim employees can enjoy additional leave to fulfil religious duties (such as going to Mecca for pilgrimage), and employees who have worked continuously for more than one year are entitled to receive a religious holiday allowance (THR) equivalent to one month's salary. Employees who have worked for more than one month but less than one year are paid in proportion. Companies must pay the above allowances to employees within 7 days before the holiday.

4.3.1.2 Severance Request

Indonesian labor laws have four types of economic compensation for the termination of labor contracts: severance pay, service period bonus, compensation, and severance pay. Companies will apply different forms of compensation according to different situations.

Table 3. Forms of Compensation According To Different Situations in Indonesia

Long Service Pay	Generally, the payment standard for service bonus is 2 months' salary for the first three years of service, and an additional month's salary for each three years thereafter. For employees who have worked for 24 years or more, a maximum of 10 months' salary will be paid. For service periods of less than three years, it will be calculated as three years.

	However, if the labor relationship is terminated due to the following reasons, the company does not need to pay the service period bonus: a. The court ruled that the employee's allegations against the company were unproven; b. voluntary termination by the employee; c. An employee is absent from work for 5 consecutive working days without permission; d. Employees commit crimes that cause losses to the company; e. The employee is unable to work for 6 consecutive months due to detention.
Compensation	The statutory compensation includes the deduction of unused annual leave and the relocation expenses paid by the company to send employees and their families back to their new place of work.
Separation Pay	Severance pay is not a mandatory economic compensation but an agreed-upon compensation, such as when an enterprise and its employees agree on a severance pay clause in their employment contract. However, if the company is not required to pay employee severance pay and service period bonus due to the following statutory circumstances, the company needs to pay the employee a severance pay. a. The court ruled that the employee's allegations against the company were not established; b. Employee voluntarily terminates the contract; c. An employee is absent from work for 5 consecutive working days without permission; an employee commits a crime, causing losses to the

Severance Payment	company; d. The employee is unable to work for 6 consecutive months due to detention. Generally, employees are paid one month's salary as severance pay for each year they work for the company, and the maximum cumulative severance pay shall not exceed nine months' salary. If the term of employment is less than one year, it shall be calculated as one year. However, there are exceptions to the severance pay standard if the labor relationship is terminated due to the following reasons: a. If an employee is unable to work for 12 months due to a long-term illness or disability, or if the employee dies, the severance pay is 200%; b. If an employee retires, the severance pay is 175%; c. If the company suffers force majeure but does not go bankrupt, the severance pay is 75%; d. If the enterprise is acquired, needs to reduce staff due to losses, closes due to force majeure, goes bankrupt, employees violate labor contracts and the enterprise has issued a warning letter, or the enterprise is in debt repayment procedures due to losses, the severance pay is 50%; e. No severance pay is required if the court rules that the employee's allegations against the company are not established; the employee voluntarily terminates the contract; the employee is absent from work for five consecutive working days without permission; the employee commits a crime, causing losses to the company; or the employee is unable to work for six consecutive months due to detention.

4.3.1.3 Employee Localization Protection

Indonesia's Labor Law, Job Creation Regulation, and Government Regulation No. 34 of 2021 on the Employment of Foreign Employees ("GR/34") all stipulate employment policies that protect the employment of domestic employees and give priority to their employment.

First, companies need to hire foreign employees when "Indonesian employees cannot meet job requirements." For every foreign employee hired, companies must hire an Indonesian employee at the same time. At the same time, companies are obliged to assign foreign employees to teach skills and professional knowledge to accompanying Indonesian employees until the Indonesian employees are qualified to take up the positions of foreign employees. Secondly, Indonesian legislation prohibits foreign employees from working in the following industry sectors: law, supply chain management, human resources, quality inspection and control, environmental affairs, health and safety, etc. However, when companies hire foreign employees as members of the board of directors or the board of directors, and foreign employees are shareholders of the company, they are not subject to the above restrictions.

4.3.2 Respect Local Religious Customs

Faith in God is one of the five principles of Indonesia's founding. With 87% of the population believing in Islam, Indonesia is the country with the largest Muslim population in the world. Faith in religion has become an integral part of the Indonesian people. The relevant legal provisions in Indonesia all reflect the corporate social responsibility of protecting local religious beliefs. For example, Article 15(b) of the Investment Law No. 25 of 2007 requires companies to respect the local culture in relevant investment activities. Article 34 stipulates corresponding penalties, such as written warnings, restrictions on business activities, freezing of business activities and/or investment facilities, or revocation of business activities and/or investment facilities. Article 28(2) of the Information and Electronic Transactions Law stipulates: "It is prohibited to intentionally disseminate information that attempts to use ethnic, religious, social and racial factors to arouse hatred or cause disputes between individuals or groups without authorization."

4.3.3 Community Relations

Social factors also require companies to deepen their relationships with various groups in the industrial chain on the basis of ensuring community construction and effectively helping vulnerable groups in society. In the new energy vehicle industry, the Indonesian government does not force companies to fulfil their social responsibilities through a series of measures to encourage companies to promote local education, conduct skills training, etc. However, the newly promulgated Indonesian Mining Law requires mining companies to allocate funds to implement community empowerment plans, including investments in education, medical care, infrastructure construction, and local business development, to implement corporate social responsibilities effectively. From this point of view, some industries have passed laws requiring companies to devote themselves to local community construction and fulfil their social responsibilities.

From a policy perspective, Indonesia is more supportive of new energy vehicle companies investing and building factories locally and is vigorously attracting foreign investment to build factories in Indonesia. Therefore, in the short term, there will not be too many restrictions on new energy vehicle companies, and the above mandatory investment requirements will not affect the new energy vehicle industry for the time being. However, in the long run, the ESG responsibility has been recognized and legalized by the Indonesian government authorities, and it may still affect other industries due to changes in national policies and other reasons, so automakers need to pay close attention to relevant legislative developments.

4.4 Governance (G)

Based on the previous review and the specific situation of Indonesian legislation, this article mainly analyses the requirements of Indonesian laws and regulations on the governance (G) factors in ESG from the two aspects of corporate governance: social responsibility and equity structure restrictions.

4.4.1 Social Responsibility

First, Article 5, Paragraph 2 of the Indonesian Investment Law stipulates that foreign investors can only conduct business activities in Indonesia in the form of a limited liability company (PT). Therefore, the provisions of the Indonesian Limited Liability Company Law are an important legal basis for social responsibility governance. Articles 66 and 77 of Indonesia's Limited Liability Company Law No. 40 of 2007 constitute the basic content of a company's fulfilment of social responsibility. It stipulates that corporate social responsibility (CSR) refers to "the company's commitment to participate in sustainable economic construction and improve the quality of life of the company itself, the local community and the entire society." Companies engaged in business activities in the field of natural resources must assume corporate social responsibility (CSR) and reserve a budget for CSR. The board of directors shall prepare a special CSR report in the company's annual report, explain the specific implementation of CSR activities, and submit it to the shareholders' meeting for deliberation. In addition, Article 15, Paragraph B of the Investment Law No. 25 of 2007 also stipulates that companies should fulfil their social responsibilities. Article 34 stipulates that violations of the above provisions will result in corresponding penalties, such as written warnings, restrictions on business activities, freezing business activities and/or investment facilities, or revoking business activities and/or investment facilities.

4.4.2 Equity Structure

In the field of investment, different countries have set corresponding positive/negative investment lists based on national security, national development needs, etc. Reflecting on the issue of equity governance structure, the country has made a series of regulations on the proportion of domestic and foreign capital and equity structure of enterprises according to the different requirements of the lists.

Indonesia has adopted a relatively open policy on equity restrictions for investment in new energy vehicles. The Negative Investment List (DNI) revised in 2021 relaxes foreign investment restrictions in the new energy vehicle industry chain (including vehicle assembly, battery production, and parts manufacturing), lists electric vehicles and battery manufacturing as priority development areas, and

allows foreign investment to hold 100% of the shares without mandatory local shareholding requirements.

5. Conclusion

Through the above multi-case analysis and comparative study, we roughly studied the market status of Indonesia's new energy vehicle market under the three-dimensional framework of ESG and compared the investment cases of domestic and foreign car companies to understand the investment environment of the Indonesian market in recent years. At the same time, through the study of Indonesian laws and regulations, we also made key refinements to the Labor Law, the Company Law, the Battery and Waste Battery Regulations, the Anti-Unfair Competition Law, etc., and analyzed the differences between them and domestic laws. We hope that the analysis and research based on real cases and laws and regulations will reflect the value of the research and help Chinese new energy vehicle companies go overseas.

5.1 Research Implications

We have studied the export of domestic new energy vehicles to Indonesia from many different dimensions. In terms of localized operations, we can learn from Toyota's "full-chain localization" experience, hire local employees, purchase local raw materials such as nickel ore to meet Indonesia's requirements for the proportion of local parts procurement, and avoid the risk of interference from local organizations (such as BYD's West Java factory has encountered conflicts). In terms of product strategy, referring to Toyota's diversified layout covering economy to high-end models, BYD can develop economy-pure electric models below RMB 150,000 while launching mid-to-high-end SUVs, and optimize the design for Indonesia's climate and family structure, such as high chassis, climate-enhanced air conditioning and cooling capacity, 7-seat layout and localized functions of the car system.

In terms of ESG compliance, the social dimension needs to strictly implement the Indonesian Labor Law, such as working hours ≤ 40 hours per week, paying overtime according to the standard (1.5-2 times on working days, 2-4 times on holidays), implementing the "foreign employees with local employees training" system (GR/34 Regulation), and setting up religious and cultural commissioners to review products and marketing content to avoid touching Islamic taboos, and actively carry out community vocational training and other public welfare projects to enhance people's favourability towards the brand. The governance dimension needs to reserve a budget for CSR by the Limited Liability Company Law (recommended ≥ 1% of revenue), prepare special reports and submit them to the shareholders' meeting, use the foreign investment 100% holding policy to establish a wholly-owned subsidiary, and participate in policy formulation by joining local industry associations to strive for subsidies and tax incentives.

In terms of risk avoidance and competitiveness building, the environmental dimension needs to establish a dual-track compliance system of "local regulations + international standards," complying with Indonesia's "Environmental Management Law" to implement the EPR system and establish a

battery recycling network, and benchmarking the EU CBAM to calculate the carbon footprint of the entire life cycle and reduce carbon intensity by purchasing green electricity. In cross-generational competition, we can learn from Toyota's forward-looking response to policies (such as early adaptation to localization policies), and at the same time, rely on Indonesia's new energy planning and nickel resource advantages, cooperate with local power companies to deploy charging piles, use ESG governance as a brand differentiation selling point, and accumulate brand reputation with Indonesia's successful market cases, and build it into a new energy hub radiating ASEAN.

5.2 Shortcomings and Prospects

This study still has limitations. First, the case coverage is not broad enough. It only focuses on BYD and Toyota and does not include other Chinese and foreign automakers with a presence in Indonesia, such as Wuling and Hyundai. The selected cases are the most representative companies, and the analysis of compliance practices of small and medium-sized enterprises is insufficient, making it difficult to reflect the industry ecology fully. Second, there are some deficiencies in quantitative analysis. Initially, we wanted to use MSCI + ESG rating data and then look for other quantifiable data, such as corporate annual reports, profit penalty data, profit growth data, etc., to complete the data-level analysis in order to find out the correlation between corporate governance and ESG environmental index and profitability, and whether it meets the expected assumptions. However, due to the difficulty in obtaining relevant data and the fact that companies and governments have certain confidentiality measures for relevant data, there is a lack of quantifiable analysis based on statistical principles at the data level, and more comparisons, cases, and empirical analysis are conducted through existing cases and regulations.

From the perspective of expanding the research, subsequent research can focus more deeply on the differences in ESG regulations faced by new energy vehicle companies in different regions around the world and build a more detailed regional compliance comparison model. For example, comparing and analysing the different focuses of Southeast Asia, Europe, North America, and other markets in terms of environmental standards, labour rights protection, and corporate governance requirements can provide a basis for companies to formulate differentiated global strategies. At the same time, with the help of big data and artificial intelligence technology, the long-term impact of ESG compliance on key indicators such as corporate financial performance, brand value, and market share can be quantitatively evaluated for predictiveness of the research conclusions.

Looking ahead to the future of the new energy vehicle industry, technological innovation will continue to lead the industry's transformation. Battery technology is expected to achieve breakthroughs, and vehicles are expected to increase their driving range, shorten charging time, and enhance safety, effectively alleviating consumers' "mileage anxiety." Intelligent and autonomous driving technologies will also be implemented at an accelerated pace, evolving from the current assisted driving to a higher level of autonomous driving, reshaping travel patterns and traffic ecology. In addition, driven by the global "dual carbon" goals, the penetration rate of new energy vehicles will further increase, and

market competition will become increasingly fierce. With their advantages in technology research and development, industrial chain support, etc., Chinese companies are expected to make greater breakthroughs in the international market, deeply integrated into the global industrial ecology through technology exports, overseas factory construction, etc., and enhance the global voice of China's new energy vehicle industry. However, at the same time, the industry also needs to cope with challenges such as the tight supply of raw materials, the rise of trade protectionism, and data security, and promote the sustainable and healthy development of the industry through measures such as strengthening international cooperation, optimizing supply chain layout, and improving regulations and standards.

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