

Carbon Emission Compliance Risk Analysis of New Energy Enterprises under the Background of Dual Carbon

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Abstract: Under the dual-carbon development goal, the transformation and upgrading of China's energy industry must be realized by adjusting the energy structure and developing new energy sources. While ushering in major development opportunities, new energy enterprises are also facing severe compliance risks and challenges under the multiple pressures of domestic and international technology, market competition, and policies. Therefore, carbon dioxide emission governance is the common mission and responsibility of the world's mankind. Emission governance is the common mission and responsibility of human beings all over the world. Only by organically combining governance and risk management can the global dual-carbon cause be pushed forward in a better way. This study is here. Taking new energy enterprises as an example, it analyzes the problems and countermeasures for the carbon emission compliance risk of enterprises from the aspects of policies and regulations, talents and technology, and industrial financing, and finally promotes the sustainable development of new energy enterprises.

Keywords: Double carbon; New energy enterprises; Carbon emission compliance; Risk Manage and control

1. Forward

In 2019, Premier Li emphasized at the National Energy Committee that it is necessary to accelerate the development of key technologies for energy development and utilization and the research of major equipment, to explore the path of commercialization of advanced energy storage and hydrogen energy, and to develop new energy industries and new business model^[1-2].

2. Carbon Emission Compliance Risk Definition of Concept

In recent years, the climate issue has gradually become a focus of attention as the global climate continues to deteriorate. Compared with the pre-industrialization period, the global average temperature in 2020 has increased by 1.02°C. The global average temperature in 2020 has increased by 1.02°C. As a result, sea level is rising rapidly at a rate of 2.97 millimeters per year. Rising global temperatures have led to frequent extreme weather events, and human society is facing great threats. Against this backdrop, carbon emission reduction has become the consensus of more and more countries and an important part of future economic activities, which will have a great impact on the production and operation of enterprises, especially those in high-carbon emission industries such as energy enterprises.

According to the National Joint Centre for the Prevention and Control of Air Pollution, China has made some progress in environmental compliance and environmental protection compared with carbon emission compliance, with sulphur dioxide concentrations in the atmosphere of 74 key cities in China dropping by 68 per cent and fine particulate matter concentrations dropping by 42 percent in 2013-2024^[3]. However, carbon emissions, mainly carbon dioxide, remain high and most of them are related to the burning of fossil fuels. In the future, carbon emission control will remain one of the most important issues to be solved in the field of environmental governance in China. As the issue of climate change gradually penetrates into the economic and corporate levels, governments, enterprises and media around the world are paying more and more attention to carbon emissions, and energy companies will face higher carbon emission compliance risks in the future. At present, domestic and

international research on carbon compliance risk has not yet formed a unified definition and quantitative indicators of carbon compliance risk. Many scholars have proposed different definitions and classifications of carbon compliance risk.

Labatt S and White R R were the first to categorise carbon compliance risks, including industry-level regulatory risks, firm-level physical and reputational risks, legal risks and competitive risks. Of these, the three enterprise-level risks are collectively referred to as business risks. Lash J and Wellington F categorised carbon compliance risks into regulatory, supply chain, product and technology, legal, reputational and physical risks. Subramaniam et al. Categorised carbon compliance risks into five categories: strategic, operational, compliance, reporting and reputation risks. Gasbarro et al. categorised carbon compliance risks into five categories: strategic, operational, compliance, reporting and reputation risks. Gasbarro et al. Categorised carbon compliance risks into five categories: strategic, operational, compliance, reporting and reputation risks. Gasbarro et al. Classified carbon compliance risks into seven categories: regulatory risk, physical change risk, product and technology innovation risk, customer demand change risk, reputational risk, financial impact risk and operational effectiveness risk. According to Wang Yao, carbon compliance risks include regulatory risks, competition risks, and border measure risks^[4]. Du Lijuan et al. believe that carbon emission compliance risks include environmental monitoring risks, stakeholder risks and internal enterprise risks. Zhou, Zhifang, and Xiao, Tian believe that carbon emission compliance risks include technical risks, accident risks, and policy control risks. Carbon emission risk, etc.

Through the above analyses, in this paper, carbon compliance risk mainly refers to the risks related to carbon emissions and carbon-containing waste treatment borne by enterprises in the process of production and operation, which may bring losses and impacts to their production and operation. As far as risk is concerned, it is the price that enterprises pay for carbon emissions. It can be seen that it is of great significance to increase the risk control of carbon emission compliance to promote the development of new energy industry. At present, the proportion of coal consumption in China's energy consumption structure is still high, while the proportion of new energy in the energy structure is still small, as shown in Table 1.

Table 1: The proportion of coal consumption in China from 2018 to 2023

Year	2018 Years	2019 Years	2020 Years	2021 Years	2022 Years	2023 Years
Coal consumption proportion	66%	64%	62%	60%	57%	55%

3. Innovative Analysis of International Carbon Emission Reduction Model

3.1 Implement the top-down Carbon Emission Reduction Model

As far as the bottom-up model of emission reduction is concerned, it has effectively broken the stalemate in the climate negotiations and curbed the trend of continuous GHG growth. At the same time, it has absorbed the shortcomings of the mandatory emission reduction model and given Parties more flexibility. The carbon emission reduction model of national autonomous contribution is not completely free to reduce emissions, but relies on top-down national sovereignty to achieve emission reduction. The combination of domestic mandatory emission reduction and international autonomous emission reduction can better implement emission reduction actions, and the strength and intensity of emission reduction actions will be constrained by national sovereignty and domestic laws and policies. The mode of emission reduction with autonomous contribution from each country is a mode of emission reduction that meets the international community's demand for carbon emission reduction. Because both developed and developing countries have to submit emission reduction commitments, and pay more attention to the principle of each according to its ability. Therefore, compared with the developed countries' rejection of the mandatory emission reduction mode, both developed and developing countries accept this bottom-up emission reduction mode. Autonomous carbon emission reduction model. In addition, the bottom-up emission reduction model respects the diversity of the international community^[5]. On the basis of full consideration of the differences in environmental problems among countries, a more scientific and rational planning mechanism can be made available to the various participants. Under such circumstances, the win-win situation of emission reduction targets and rational use of resources can be achieved more quickly.

3.2 Build a Sustainable Development Mechanism

In order to promote international cooperation in emission reduction, the Paris Agreement established the sustainable development mechanism on the basis of the clean development mechanism established by the Kyoto Protocol. The establishment of the sustainable development mechanism is closely related to the carbon emission reduction model contributed by our country on its own. The sustainable development agenda puts forward 17 sustainable development goals in three important aspects: social, economic and environmental, covering the common vision of the people of developed and developing countries. The so-called Clean Development Mechanism (CDM) is a co-operation between developed and developing countries to reduce emissions and fulfil their mandatory emission reduction obligations. For developing countries, carbon emission reduction is mainly achieved through reducing deforestation and forest degradation, and the protection of forests, sustainable management of forests, and the increase of forest carbon stocks (REDD+) is also an incentive mechanism. Under the Paris Agreement, some Parties will still achieve their nationally owned contributions through REDD+^[6]. Therefore, GHG reduction through REDD-plus continues to be respected by developing countries. As each developing country faces different national circumstances, the level and scale of technical and financial support required to meet those circumstances will vary. Voluntary cooperation under the sustainable development mechanism could address the needs of these developing countries, taking into account environmental integrity and accounting in accordance with guidance adopted by the Conference of the Parties.

3.3 Implementation of Transparent Framework Standards

The transparency framework is based on the national communications in the United Nations Framework Convention on Climate Change, which set out different information reporting obligations for developed and developing countries. The requirements are more stringent for developed country Parties, which are required to submit information every four years, and the communications should be as detailed as possible. However, there are no detailed time requirements for developing countries, and the submission of information is contingent on the provision of adequate financial resources by developed countries. In addition, in order to ensure the effective implementation of the Paris Agreement, Article 13 establishes a transparency framework. The transparency framework no longer distinguishes between developed and developing countries and applies to all parties. It covers a wide range of topics, including information on all aspects related to carbon emission reduction and climate adaptation. Self-determination of national self-contributing modalities for emission reductions is not a mandatory requirement for Parties to reduce emissions and achieve their emission reduction targets. An analysis of the transparent framework of the Paris Agreement reflects the innovation and development of the international system in addressing climate change. Developing countries are mentioned several times, and the principle of common but differentiated responsibilities runs through it. While both developed and developing countries are required to submit information to participate in the review, the transparency framework is intended to provide flexibility not only for developing country parties, but also to take into account the situation of some international least developed countries and small island developing States. The transparency framework was established to build mutuality among Parties. Confidence in addressing climate change and achieving emission reduction targets. The layout of the specific industrial framework is shown in Figure 1.

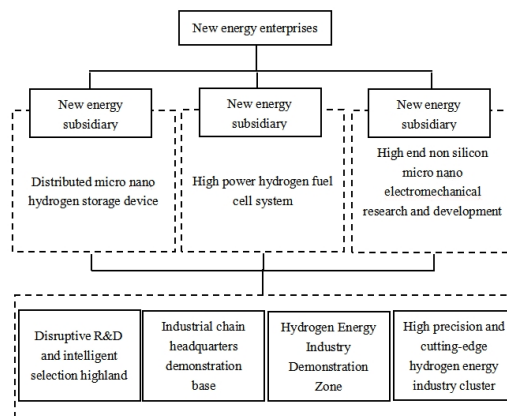


Figure 1: Layout of Enterprise Hydrogen Energy Industry

3.4 Build a Global Inventory Mechanism

The Global Inventory Mechanism (GIM) is essentially a feedback mechanism that summarises the results of the assessments of individual countries or regions, leading to conclusions at the global level. These conclusions will inform Parties when they submit their next round of national independent contributions. The process of the global inventory mechanism should begin with the collection and processing of relevant data and information, in particular information obtained from the transparency framework. As envisaged by the Conference of the Parties, the global inventory would take the form of a public assessment focusing on Parties' transparency reports and nationally owned contribution documents, including public consultation and feedback on this information^[7]. The smooth running of the global inventory is linked to the information provided by the transparency framework. The more accurate and detailed the information provided by the transparency framework, the easier the inventory will be. Therefore, the establishment of the point mechanism is a great step forward for the global inventory, but its implementation needs to be carefully analysed in the context of the first inventory.

4. Under the Background of Double Carbon Emission Compliance Risks of New Energy Enterprises

4.1 Policy and Legal Risks

The risk of changes in policies and regulations includes the adjustment of tax and fee policies in resource countries, the adjustment of climate policies, and the improvement of industry standards. Among them, the risk of tax and fee policy adjustment refers to the impact of the levying of carbon tax and resource tax or the increase of corresponding tax rate by resource countries on the normal operation of enterprise projects. With the increasing pressure to cope with climate change, the possibility of resource countries levying carbon emission tax or raising the tax rate of carbon emission-related taxes will greatly increase in the future. Adjustments in national tax policies will increase the operating costs of local projects and harm corporate profits. Climate Policy Adjustment Risk refers to the relevant policies, regulations and government plans introduced by the governments of resource countries to address climate change, including restricting the development of fossil energy and encouraging the development of new energy sources, thus adversely affecting the investment and operation of local energy enterprises. The risk of raising industry standards refers to the governments of resource countries raising industry standards in high-carbon emission areas such as oil and gas, which will adversely affect project operations. As a result, in order to ensure the competitiveness of domestic products, some resource countries may impose barriers to the import of high-carbon emission equipment or products.

4.2 Risks at the Technical Level of Talents

The development of a green and low-carbon transition in resource-based countries will expose energy enterprises to higher risks in terms of human resources and technology. In terms of human resources, with the development of the low-carbon transition, the knowledge and skills of practitioners in energy enterprises may be difficult to meet the needs of a low-carbon society. If these practitioners are unable to learn and master the relevant knowledge and skills of the low-carbon economy in a timely manner, and enterprises are unable to recruit the required professional and technical talents in a short period of time, these energy enterprises will face the risk of a talent shortage^[8]. In terms of energy transition, carbon emission reduction and other technologies, under the guidance of relevant government policies, innovations in the fields of new low-carbon emission reduction, renewable energy, new energy vehicles, battery and energy storage technologies, and new materials will continue to be promoted, which will cause changes in the relative prices of different products and the market share of enterprises, thus affecting their profitability. In this process, whether energy enterprises lagging behind in the development of low-carbon areas can quickly change their business model is the biggest risk they face.

4.3 Risks at the Level of Industrial Financing

In the process of energy enterprise construction, the strengthening of carbon emission reduction regulation in resource countries will create new financing constraints. With the introduction of strict legal policies related to carbon emission reduction in resource countries, the entire economy and

society will develop towards a green and low-carbon level in the future. Firstly, guided by environmental protection trends, investors need to increasingly consider environmental and climate risk factors in their investment decisions. In recent years, in order to address rising global temperatures and climate change, many developed countries and financial institutions have announced that they have stopped financing high-carbon enterprises and projects, and it may become more difficult for traditional energy companies to finance themselves in the future. Secondly, governments of resource countries may increasingly provide subsidies and concessions for new energy investment and cooperation, which will give new energy enterprises a special competitive advantage in the financial market, further squeezing the share of financing and the scale of financing available to traditional energy enterprises in the market^[9].

5. Under the Background of Double Carbon Emission Compliance Risks of New Energy Enterprises Improvement Countermeasures

5.1 Strengthen the Construction of the Legal Level of Carbon Emission Policy

From the current development of new energy enterprises, the number of resources and legal practices for constructing dual-carbon targets are relatively small, and in the short term, the carbon emission compliance risk of China's energy enterprises' overseas business is relatively small. In the long term, under the general trend of global climate change, future resource countries may adjust laws, regulations and policies related to carbon emissions such as taxation and development planning, and raise the carbon emission reduction standards of the traditional energy industry, which will increase the policy and legal risks of carbon emission compliance. Enterprises should attach great importance to the above risks that they may face in their future investment and cooperation in key resource countries, pay close attention to and track the formulation or adjustment of the relevant laws, regulations and policies of these countries, and make a good judgement and relevant plans in advance.

5.2 Strengthen the Investment of Carbon Emission Talents at the Technical Level

Technological innovation plays an important role in supporting the transformation of traditional energy enterprises and reducing carbon emissions. Chinese energy companies should increase their investment in carbon emission reduction, new energy and other related technology areas. On the one hand, increase investment in technologies in the field of carbon capture, utilisation and sequestration, and reduce their application costs, so as to incorporate the use of relevant technologies in traditional oil and gas business, and improve the enterprises' carbon emission reduction capacity and strength in the process of production and operation in resource countries. On the other hand, increase investment in technologies in the field of carbon capture, utilisation and storage to reduce their application costs, so as to incorporate the use of relevant technologies in traditional oil and gas business, and improve the enterprises' carbon emission reduction capacity and strength in the production and operation process in resource countries^[10]. On the other hand, increasing scientific and technological investment in the field of new energy and improving the integration and development capacity of traditional and new energy sources will provide support for the enterprise's project to reduce overall carbon emissions.

In addition, Enterprises should also do a good job in advance of the talent reserve plan, such as increasing the recruitment of new talent, low-carbon knowledge and skills training for the original staff, so that they can adapt to the needs of low-carbon transformation, to avoid future structural shortages of talent.

5.3 Deepen the Financing Cooperation of the Carbon Emission Industry

When enterprises carry out traditional energy cooperation in resource countries, they should study and analyse the resource endowment and development economics of new energy of the host country, and integrate the development of new large-scale fossil energy projects with the integrated development of new energy by combining the characteristics of new energy endowment, development needs and development planning of the host country, such as desert oil and gas projects can be combined with photovoltaic projects, and offshore oil and gas projects can be combined with offshore wind power projects. This approach not only enables enterprises to circumvent the financing restrictions imposed by international financial institutions on a single traditional energy project, but also helps them to expand new opportunities for overseas energy cooperation.

6. Conclusion

Overall, in the context of energy industry transformation and upgrading, new energy enterprises have received a lot of policy support and market demand dividends. At the same time, they are facing increasingly fierce market competition pressure. Among them, with the two-way increase of operation scale and capital scale, new energy enterprises face financial risk, technical risk, violation risk and other problems. In response to this problem, more and more scholars have explored how to solve the development problems of new energy enterprises and put forward a series of solutions. Some scholars propose to actively promote indirect financing and direct financing to solve the financing difficulties of new energy enterprises, especially small and medium-sized energy enterprises. Some scholars also proposed to establish a new energy statistics system in line with international standards. Doing a good job in new energy statistics can provide an important basis and reference for new energy scientific research, decision-making of government departments, and the formulation of enterprise development goals. Therefore, this paper analyzes and elaborates in detail the carbon emission development issue of new energy entry from the perspective of compliance risk control.

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