

Low Carbon Governance and Carbon Auditing: An Analysis Framework

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Abstract Climate change has become a political and economic problem in the world, with the formally effective of the "Kyoto Protocol" in 2005, carbon auditing issues is increasingly attracting the attention of the theorists and practitioners. Low carbon governance elements and carbon audit relationship theory analysis is Based on realistic background and the government - market - enterprise level. The analysis shows that, the low carbon governance goal is higher, the greater the demand of carbon auditing. Carbon auditing plays an important role in the realization of the goal of low carbon management, which is an important part of low carbon governance, constructing scientific and effective carbon audit mechanism, and playing as the immune function in the low carbon governance.

keywords Carbon Auditing, Low Carbon Governance, Carbon Auditing Mechanism

1. Introduction

Global warming has become a hot topic of current international society, The Plenum of the 18th clear the importance of environmental protection and construction of ecological civilization. Auditor-general Liu Jiayi also proposed that audit work of the current and future periods main purpose is to increase the audit efforts on environmental protection and utilization of energy resources, promoting the construction of ecological civilization in 2012. Wang Fan [6] states that the UK government published the "energy white paper" in 2003 that first mention of low carbon economy. The white paper means that low carbon economy is consumption of less natural resources and less environmental pollution, to gain more economic output. Qian Chun [4] studied on carbon audit, which is the independent audit institution examine and audit the government and enterprises in fulfilling the responsibility of carbon emissions, which is an important branch of environmental audit, carbon audit supervise and evaluate the management activities and result of carbon emission. In China, the low carbon economy still needs a

long time to realize, and carbon audit is an essential part of the supervision mechanisms.

Andrew C. Lovell [11] proposed that In England, America, Denmark and Australia and other western countries where the carbon audit practice is developed, many researchers are devoted to carbon audit in recent years, in order to achieve the promotion of targets for reducing carbon emissions, carbon emission reduction through national policy leverage strategy "top-down" to local government and local department by "bottom-up" approach, the key driver of this transition the way is the development of environmental auditing technology, making practical and comprehensive carbon audit framework. Shilpa Verma [12] thought that the general process of carbon audit:is to collect information from employees; organization building survey; carbon footprint calculation; the site visit; and generating carbon audit report under the carbon auditing framework; These studies played a positive role in promoting the development of carbon auditing. At the same time, these countries also developed carbon audit practice carefully, UK has implemented carbon audit and constructed zero carbon community; America focus on carbon auditing of automobile, real estate and way of life; Denmark's carbon audit focus on building. Hong Kong is the first area to carry out carbon audit in China, and was first introduced the building "carbon audit guidelines" in 2008 July, put forward a set of scientific methods of accounting and reporting of building carbon emissions. Based on the existing framework of carbon audit literature, through the study of the relationship between low-carbon governance (low carbon tax, carbon accounting, carbon trading, carbon price, carbon neutral, carbon quota and the carbon disclosure) and carbon audit, constructing a set of comprehensive carbon audit mechanism, provides the foundation and reference for future research of carbon the audit field in China.

2. The Relationship between Low Carbon Governance and Audit Theory

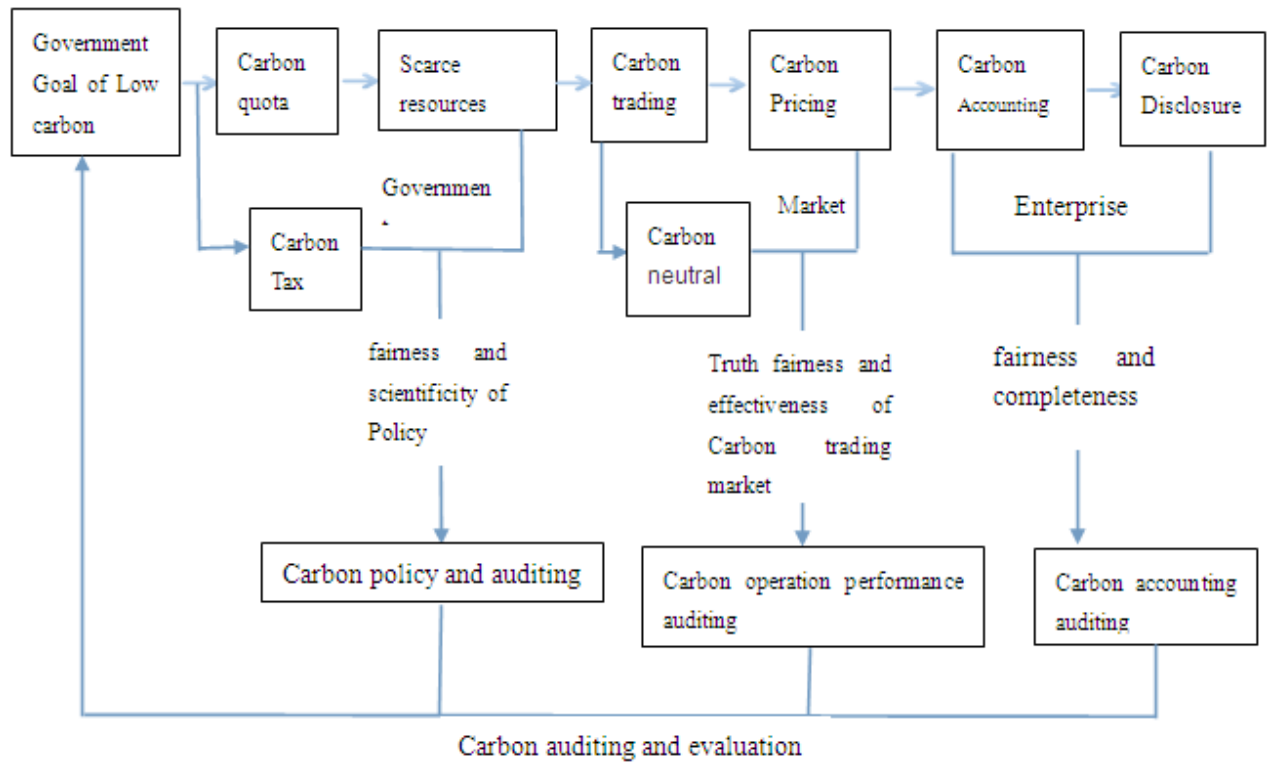


Figure 1. low carbon management and carbon audit diagram

Low carbon governance is a complex system, in which government, market and enterprises play their respective functions. The government regulates and control of low carbon economy operation through the macro mode of governance such as carbon quotas and carbon tax. Carbon markets optimize the allocation of resources and low carbon. through carbon trading, carbon pricing and carbon neutral market governance, The enterprise fairly reflect the essence of carbon trading through the carbon accounting and information disclosure of corporate governance of carbon on the carbon trading. Whether the carbon pricing, carbon neutral is true, fair and efficiency, should be verified by internal and external audit, whether the carbon accounting and disclosure of carbon enterprise is fair and complete should be verified by external audit. Their relationship as shown in figure 1:

3. Low Carbon Management and Audit Based on the Government Level

3.1. Carbon Tax and Audit

A carbon tax is a tax on fossil fuels according to their carbon content and carbon emissions, equivalent to the Pigovian tax, thereby affecting the economic subject decision by internalization of external costs of the carbon tax include into the price system

The legitimacy and effectiveness of fiscal funds should fall into the supervision scope of the government audit.

Carbon audit on the carbon tax revenue is the auditing on fiscal funds after carbon tax, and then auditing on the fiscal funds and its use. If the carbon tax is special tax revenue, auditing is to ensure the earmarking, prevent misappropriation of funds; Liu Xuanhao [10] states that if the carbon tax revenues belongs to the general budget, general budget should be audited; the enterprises could get the carbon tax advantages if they could meet the relevant goals, and the entitlement of the tax advantages could generate the power rent-seeking, therefore, carbon audit is essential. At the same time, carbon data obtained by auditing could contribute to the carbon tax system construction. A carbon tax is an important policy means to achieve emissions targets, tracking audit supervision and evaluation, on the carbon tax policy formulation and implementation is an important manifestation of the national audit services to the state of low carbon governance. Generally speaking, the carbon emissions targets, other conditions unchanged, the carbon tax policy implementation more widely, carbon audit supervision surface and the strength is greater, the more reasonable to ensure the realization of the effective carbon tax policy and macro governance objectives (see Figure 2).

3.2. Carbon Quotas and Auditing

Carbon quota refers to the government set the upper limits of the industry carbon emissions, allocating a certain number of emissions permits to the enterprise in the trading system, the generalized carbon quotas also includes a personal carbon allowance (PCA). A limited carbon

emissions quota will be allocated to certain industries such as power industry, energy, cement. Qiu Lihui [8] proposed that the enterprise who exceed the allocated standard need to buy carbon quotas from carbon trading market. Because the carbon quota is invisible, to ensure that relevant data is true, basis for the carbon trading market running is reliable, it is need to establish strict standards and credible verification system, namely carbon audit. National regulatory authorities should find out the enterprise's "carbon footprint" before the enterprise carbon trading, and then determine the enterprise quota of carbon emissions combined with the future emission reduction requirements, and according to the carbon emission of each industry; at the same time, in the periodic evaluation, the government should supervise and evaluate the enterprise's report of emissions behavior, the purpose is to guarantee carbon allocation is fair, impartial, and to improve government department or enterprise carbon quota management, performance and responsibility consciousness.

In general, the government is configured on the industry's carbon quota is higher, means the intensity of the carbon audit for monitoring and evaluation of the industry should be greater, with the certain carbon emissions targets, and other conditions unchanged.(see Figure 2).

4. Low Carbon Management and Audit Based on Market Level

4.1. Carbon Trading and Auditing

Carbon trading is a party so as to mitigate the greenhouse

effect to achieve their emission reduction targets to purchase the greenhouse gas emission reduction amount from another party in a contract. The foundation of domestic carbon market construction is to found monitoring, reporting and verification (MRV) system for greenhouse gas emission by the key enterprises in key sectors, third party independent verification process is closely related to carbon auditing.

The high quality independent assurance service is required to establish and perfect carbon trading market, i.e. carbon audit. The manufacturer of carbon trading is the government, i.e. The government allocate of carbon emission trading rights, which requires a jointly participation by the public in a disclosed and transparent environment. It is urgent to build a set of improved carbon audit mode due to the largely investment of resources, and complex, special economic activities, ensuring the effective implementation of the quota system, and promoting the benefit of carbon trading market by supervising the utilization of carbon quota. Han Fuheng [7] put forward, the CPA participate into carbon trading in the identity of an independent third party, provides assurance service for the related information of carbon emissions trading, which could reduce information asymmetry of carbon trading market, and make the transaction price more reasonable, and ensure the smooth running of the carbon emissions trading market.

In general, based on the certain carbon emissions targets, and other conditions unchanged, the more effective of carbon trading, the more need for high quality and strong degree of carbon audit to supervise, evaluate and verified the effectiveness of carbon trading market. (see Figure 3).

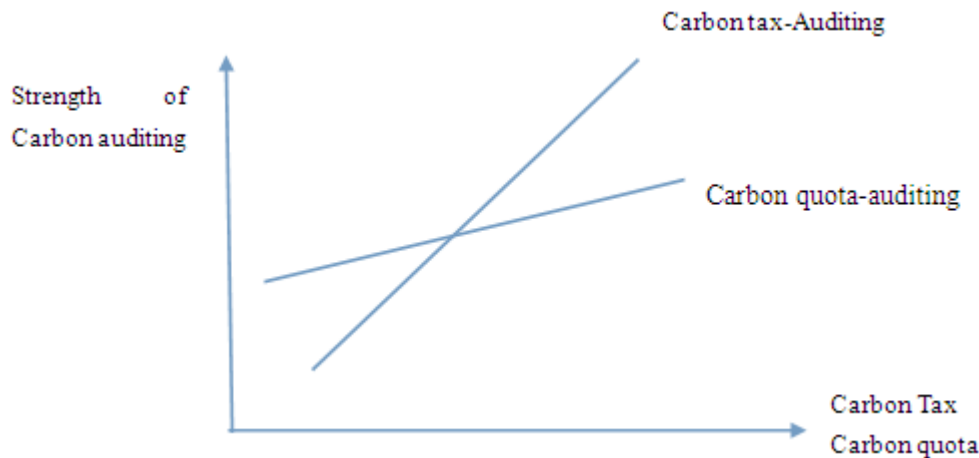


Figure 2. carbon policy and carbon audit

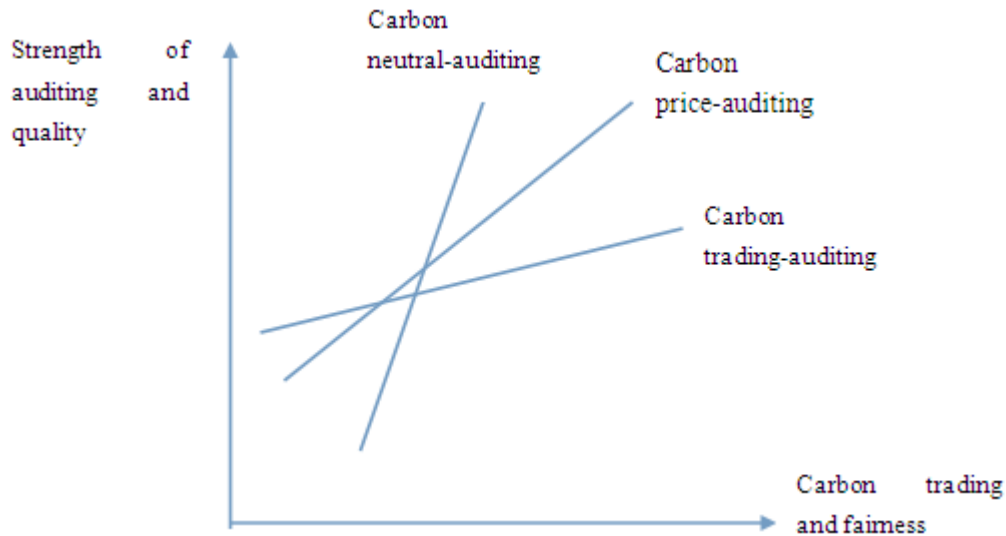


Figure 3. Carbon market and carbon audit

4.3. Carbon Neutral and Auditing

Carbon neutral refers to a neutral (zero) of total carbon emissions, offsetting measures depend on how much carbon emissions in order to achieve the balance. Carbon neutral has become the urgent situation, because of concerns about global climate change.

The enterprise should calculate carbon footprint and establish low carbon system to realize the offset carbon emissions; then reduce carbon emissions; finally, achieve carbon neutrality. Neutralization of carbon market transactions is based on voluntary, enterprise achieves the carbon offset through the voluntary purchase carbon credits. Carbon neutral are usually achieved by the buyers (emitter), Seller (emission reduction ') and transaction institution (intermediary) three parties, carbon audit plays an important role of supervision in the whole process. The independent auditing is the main carbon neutral auditing taking the authentication, identification and other assurance methods. In general, based on the certain carbon emissions targets, other conditions unchanged, the more effective of carbon neutral, higher requirement strength and quality of audit attestation service. Carbon audit reasonable assurance of the validity of carbon neutral (see Figure 3).

5. Low Carbon Management and Audit based on Corporate Governance

5.1. Carbon Accounting and Auditing

Carbon accounting includes enterprise carbon accounting and product carbon accounting. At present the most widely used carbon accounting standard by domestic and international is the greenhouse gas protocol issued by WRI/WBCSD: "corporate accounting and reporting standard" (GHG Protocol) and ISO released ISO-14064 in greenhouse gas accounting standards. Generally speaking, enterprises carbon accounting is on the basis of ISO-14064, and product carbon accounting is based on GHG Protocol.

Enterprise carbon inventory, carbon accounting work, need to be supervised and supported by the carbon audit. The carbon audit could assure the carbon accounting procedures and methods of organizations comply with the relevant standards, to ensure the reliability and accuracy of carbon accounting. And the accuracy of carbon account measurement is foundation of the follow-up carbon audit. In general, based on the certain carbon emissions targets, other conditions unchanged, carbon accounting auditing is stronger, the higher quality of carbon accounting information. Carbon audit adds credibility to the carbon accounting information (see Figure 4).

5.2. Carbon disclosure and audit

In 2009, China Securities Regulatory Commission require listing Corporation to develop specific content of social responsibility report according to their own characteristics, the carbon disclosure is an important part of social responsibility report.

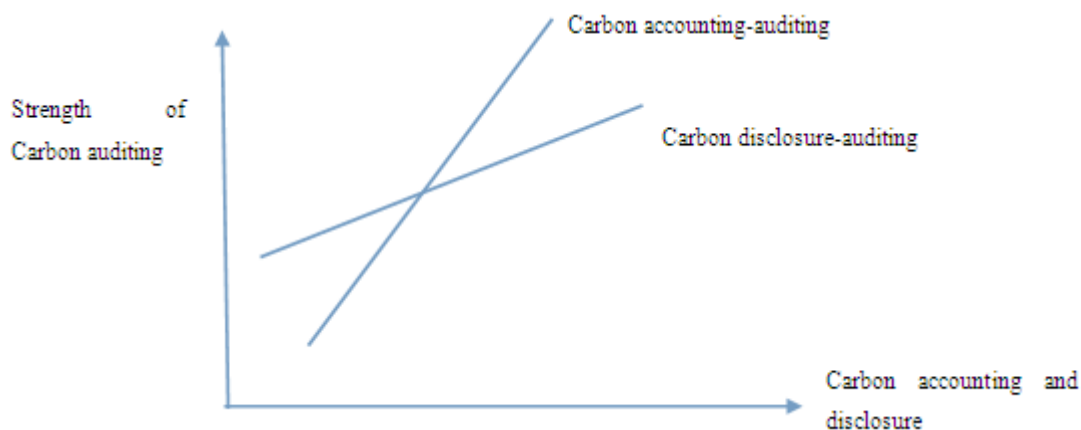


Figure 4. Disclosure of carbon accounting and carbon audit

CPA should consider the possible environmental issues of material misstatement in the financial statements and the truth of carbon disclosure during the auditing. Enhanced auditing of carbon emissions measurement and enhanced information sharing is the effective way to improve the quality of information disclosure of carbon. Wang Fangjun [9] points out, the international "big four" Accountancy Firm provide assurance services for enterprises of the carbon disclosure, giving reasonable assurance or limited assurance, mainly according to the process of non-accountancy service regulated by ISAE3000 (including professional ethics, quality control, the reasonable plan, the appropriateness of occupation standard, professional suspicion, risk and the substance, reliability of the auditing evidence, experts involvement, filing and reporting). Chen Hua [1] thought that China's government should strengthen the carbon disclosure audit and supervision function In the face of the current situation of carbon voluntary information disclosure by the listing Corporation , so as to ensure the reliability and the decision usefulness of carbon information, boost the industrial structure adjustment. In general, based on the certain carbon emissions targets, other conditions unchanged, the higher carbon disclosure requirements, the greater demand for carbon audit. Carbon audit and assurance could benefit the fully disclosure of carbon information. (see Figure 4).

6. Conclusion and Suggestion

Carbon auditing is a comprehensive audit of financial auditing, legal compliance auditing, performance auditing and social responsibility auditing. Carbon auditing is an important component of low carbon governance, is an important performance of the audit services state of governance. There are both opportunities and challenges, there are also advantages and disadvantages in the implementation of carbon auditing in China. Multilayer demand for low carbon governance, is the root of origin and development of carbon auditing, the higher of low carbon governance goal, the higher quality and higher demand on carbon audit, and the more effective of carbon audit function,

the more conducive to the realization of the goal of low carbon governance. The carbon auditing mechanism must be designed effectively in order to meet the high standard requirement of the need for low carbon governance, by preventing, detection and recovery, so as to achieve the goal of low carbon governance.

The carbon auditing mechanism should be based on government - market - enterprise low carbon governance system, comprehensively reflect the supervision and evaluation of carbon audit function. The government should develop carbon audit framework and specific low carbon policy in accordance with China's conditions, providing a basis for developing carbon audit. The market, should construct improved carbon market trading system, and the carbon audit should play the role of evaluation of the independent as an independent third party. The enterprise should disclose the comprehensive carbon information, invest in low-carbon technology research and development, and audit the truth, legitimacy and efficiency of the funds for low carbon technology development.

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REFERENCES

- [1] Chen Hua. Carbon enterprise information disclosure in China: content definition, measurement methods and present research situation [J]. accounting, 2013 (12): 18 - 24
- [2] Wang Aiguo. Foreign carbon audit and Its Enlightenment to China [J]. audit research, 2012 (5): 36 - 41
- [3] Ye Chengang, Cheng Xinsheng. The comparison and selection of internal audit mechanism--based on the corporate governance analysis [J]. Auditing Research 2006, (6): 79-85.
- [4] Qian Chun, Su Ning. Study on the subject of carbon audit in China [J]. friends of accounting, 2011 (6): 76 - 78

- [5] Wang Fan. Low Carbon Auditing in UK: review framework and Enlightenment [J]. *Economics and Management*, 2010,24 (11): 70 - 74
- [6] Wang Fan, Zhang Longping. Study on audit evaluation system of carbon emissions: evolution and Enlightenment [J]. *China's CPAs*, 2014 (3): 29 - 34
- [7] Han Fuheng. Environmental accounting and carbon trading [N]. *Accounting report of China* ., 2014-3-14 (269).
- [8] Qiu Lihui. Analysis on the construction of auditing on China's government allocation of carbon trading right [J]. *people's forum*, 2013 (12): 99 - 101
- [9] Wang Fangjun. Study on national carbon emissions disclosure under the low carbon economy[J].*Studies in science* 2011,29 (4): 515 - 520
- [10] Liu Xuanhao . Study on the legislation of carbon tax in China [D].Hunan: Zhongnan University, 2011
- [11] Andrew C. Lovell. Developing A Carbon Audit Framework To Support Corporate Level Carbon Reduction Strategies[D].England: University of East Anglia:2003.
- [12] Shilpa Verma. Green Audit–A Boom to Human Civilization[J].*International Journal of Trends in Economics Management & Technology*, 2012,1(6):345-356.