Comparison of Carbon Budget of Enterprises at Home and Abroad

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Abstract. At present, energy conservation and emission reduction has become the background of enterprise development, and carbon budget is of great significance for carbon emission reduction tasks, but there is still a gap between the implementation of carbon budget in China and that in foreign countries, so this paper compares the implementation of carbon budget in domestic and foreign enterprises. This paper mainly studies this subject through questionnaire survey, network survey, individual analysis and other research methods, and analyzes the reasons for the better implementation in foreign countries and the experience that can be used for reference in China.

Introduction

The carbon budget is the upper limit of the UK's total greenhouse gas emissions over a specific period of time. It was first proposed by the planners of the Kyoto protocol. Its initial goal is to determine the amount of carbon that a country or even the world will allow to be emitted into the atmosphere within a certain period of time. According to the understanding of carbon experts, from the perspective of scope, carbon budget can be divided into global budget and national budget carbon budget involving initial distribution, adjustment, transfer payment, market, financial mechanism, and The implementation of reporting, verification and compliance mechanisms requires a set of corresponding international climate systems to encourage and promote countries to control emissions within the scope of carbon budget and contribute to the long-term goal of global climate protection. The current carbon budget is mainly based on the design of national or interregional mechanisms. It is a macro level budget. From the micro level, as a social economic cell, enterprises should also consider their own sustainable development, and build a more perfect carbon budget system.

China's government has set a medium and long-term emission reduction target that the carbon emission intensity per unit of GDP will be reduced by 60%-65% compared with 2005, and has issued a series of policies and measures to encourage low-carbon development and energy conservation and emission reduction, such as vigorously implementing the low-carbon city pilot, and establishing a local and national carbon emission trading market.

The national development and Reform Commission (NDRC) has launched guidelines for greenhouse gas emission accounting and reporting for key emission industries and enterprises, aiming to strengthen the carbon emission management of enterprises and drive the carbon emission reduction response of enterprises. On the one hand, it is the government's carbon emission quota restriction, on the other hand, it is the market's concept of green environmental protection. Under the dual pressure, enterprises urgently need to explore management and emission reduction tools, innovate management and emission reduction system, so as to reasonably plan the carbon emission and carbon emission reduction activities of enterprises, so that enterprises can change from the unsustainable high energy consumption and high emission business model to the sustainable low-carbon and green business model.

The development of enterprise carbon budget is an important carbon emission reduction system arrangement and management innovation. Through the systematic planning of enterprise's carbon emission, carbon emission reduction and carbon emission trading activities in the form of enterprise budget, the specific budget tasks are formed, which are decomposed into all links and departments of production, and real-time control and adjustment are carried out in the budget implementation.
process to ensure the realization of enterprise's carbon emission target and carbon emission reduction target, which is the lack and urgent need of current enterprise's comprehensive budget management. Expanded fields and objects. The development of enterprise carbon budget can conform to the current situation of low-carbon economic development, and effectively meet the needs of enterprise carbon emission and scientific management of carbon emission reduction under low-carbon economy. From a new perspective, the development of enterprise carbon budget is actually a comprehensive green budget system, a micro institutional guarantee for enterprises to actively carry out carbon emission reduction, and a management innovation to practice low-carbon development.

Implementation of Carbon Budget in Domestic Enterprises

At present, some Chinese enterprises have consciously controlled carbon emissions and gradually moved closer to the implementation of carbon budget. For example, China Huadian Group Corporation put forward some new ideas and methods in promoting carbon emission reduction. China Huadian has set up a carbon emission management office in the Ministry of science, technology and environmental protection of the group company. It is the only group among the five major power generation groups that has set up a carbon emission management organization at the level of the group headquarters. It has promulgated the administrative measures for the statistical accounting of greenhouse gas emissions of power generation enterprises, established a three-level reporting system from the bottom up, and completed the construction of the carbon emission electronic reporting system. Vigorously implement carbon emission reduction measures. First, adhere to the green and low-carbon development path, and constantly optimize the power supply structure. We will continue to optimize and develop high parameter and large capacity coal power projects, vigorously develop hydropower and wind and solar power, and build gas-fired power generation units in line with local conditions. In 2015, the installed capacity of clean energy ranked first among the five major power generation groups, reaching 50 million kilowatts. During the 12th Five Year Plan period, the carbon dioxide emission reduction by structural adjustment reached 150 million tons, making a great contribution to the emission reduction. By the end of 2015, the company's coal consumption for power supply was 305.2g/kwh, which has been the lowest among the five major power generation groups. The coal consumption for power supply of unit 2 of China Huadian Jurong Power Generation Co., Ltd. was 277.90g/kwh, ranking first in the 2015 energy efficiency benchmarking of conventional coal-fired thermal power units of central enterprises just released by the state owned assets supervision and Administration Commission. During the 12th Five Year Plan period, energy conservation, consumption reduction and carbon dioxide emission reduction were about 54.82 million tons. The growth of total carbon emissions is significantly lower than that of energy supply. From 2010 to 2015, the average growth of installed capacity, power supply and heat supply in China was 8.90%, 6.25% and 11.18% respectively, while the average growth of total carbon emissions was only 3.09%, significantly lower than that of energy supply. During the "12th Five Year Plan" period, China Huadian achieved remarkable results in carbon emission reduction. In 2015, the carbon emission intensity of unit power supply decreased by 16.8% compared with that in 2010. However, most enterprises, especially some small-scale enterprises, have not realized the importance of implementing carbon budget. According to some data, among the national carbon emissions, the total carbon emissions of more than 1700 power enterprises have reached more than 3 billion tons. These data tell us that although a few large-scale state-owned enterprises are aware of the importance of carbon budget and can formulate and implement plans, the vast majority of small and medium-sized enterprises are still lack of in-depth understanding of the historical significance of energy conservation and emission reduction, and the implementation of carbon budget work and tasks cannot be delayed.

Implementation of Carbon Budget in Foreign Enterprises

Compared with developing countries, foreign developed countries have earlier industrial
development and environmental problems, so carbon emission reduction work is relatively in-depth, with more understanding and implementation experience of carbon budget. Take the UK, which implemented carbon budget earlier, as an example to observe the effect of carbon budget implementation. The following table shows the UK’s greenhouse gas emissions over the past decade. It can be seen from the figure that the overall UK’s total greenhouse gas emissions have declined. According to this, many experts and scholars analyze that this phenomenon has a great relationship with the implementation of carbon budget in the UK and the implementation of carbon emission reduction and carbon budget by British enterprises. From this point of view, the implementation of UK carbon budget is relatively mature and has played a great role.

Table 1. UK’s greenhouse gas emissions.

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<tbody>
<tr>
<td>Net CO₂ emissions (emissions minus removals)</td>
<td>545.9</td>
<td>531.1</td>
<td>480.8</td>
<td>498.3</td>
<td>455.6</td>
<td>474.2</td>
<td>464.0</td>
<td>424.9</td>
<td>408.3</td>
<td>385.8</td>
<td>373.2</td>
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<tr>
<td>Methane (CH₄)</td>
<td>78.6</td>
<td>73.0</td>
<td>68.5</td>
<td>63.9</td>
<td>61.2</td>
<td>59.6</td>
<td>55.5</td>
<td>53.3</td>
<td>52.7</td>
<td>51.1</td>
<td>51.5</td>
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<tr>
<td>Nitrous oxide (N₂O)</td>
<td>23.2</td>
<td>22.5</td>
<td>21.0</td>
<td>21.3</td>
<td>20.6</td>
<td>20.4</td>
<td>20.3</td>
<td>20.8</td>
<td>20.3</td>
<td>20.2</td>
<td>20.5</td>
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<td>Hydrofluorocarbons (HFC)</td>
<td>14.4</td>
<td>14.9</td>
<td>15.5</td>
<td>16.4</td>
<td>14.8</td>
<td>15.4</td>
<td>15.7</td>
<td>15.9</td>
<td>15.9</td>
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<td>Perfluorocarbons (PFC)</td>
<td>0.3</td>
<td>0.3</td>
<td>0.2</td>
<td>0.3</td>
<td>0.4</td>
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<td>Sulphur hexafluoride (SF₆)</td>
<td>0.9</td>
<td>0.7</td>
<td>0.6</td>
<td>0.7</td>
<td>0.6</td>
<td>0.5</td>
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<td>Nitrogen trifluoride (NF₃)</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
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<tr>
<td><strong>Total greenhouse gas emissions</strong></td>
<td><strong>663.2</strong></td>
<td><strong>642.5</strong></td>
<td><strong>586.7</strong></td>
<td><strong>600.9</strong></td>
<td><strong>553.2</strong></td>
<td><strong>570.4</strong></td>
<td><strong>556.2</strong></td>
<td><strong>515.6</strong></td>
<td><strong>498.0</strong></td>
<td><strong>473.1</strong></td>
<td><strong>460.2</strong></td>
</tr>
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Figure 1. Total greenhouse gas emissions.

Not only Britain, but also other western developed countries have taken corresponding measures and achieved good results. As a major energy country in Europe, France passed the ambitious energy transition for green growth act in mid-2015 to adjust the energy consumption structure, promote the further development of renewable energy and environmental protection industry, and transform to a low-carbon economy. The long-term goal of the bill is to reduce greenhouse gases by 75% and total energy consumption by 50% at 1990 levels by 2050. In order to achieve the above
goals, the bill introduced two policy instruments, carbon budget and national low-carbon strategy, to reduce the national carbon footprint, and issued three stage carbon budget goals (2015-2018, 2019-2023 and 2024-2028 respectively). According to the bill, the French parliament must make a carbon budget every five years, setting emission caps for industries such as transportation, construction, industry, agriculture, energy and waste. Within the carbon budget, the national low-carbon strategy also puts forward specific suggestions for the low-carbon transformation of various industries. For example, during 2015-2018, through improving the energy efficiency of vehicles and promoting the development of clean energy vehicles (electric vehicles, biofuels, etc.), the goal of reducing greenhouse gas emissions by 29% in the transportation industry is achieved. It also plays a significant role in reducing carbon emissions in France.

With the achievement and experience of Britain and France in national carbon budget management, the management concept of carbon budget has also attracted more discussion in other countries. For example, some scholars in Canada suggested that the government should follow the example of Britain, France and other countries to take the carbon factor into account in their own financial budget system, promote the realization of the goals of the Paris Agreement and transform to a low-carbon society.

**Suggestions on Carbon Budget of Domestic Enterprises**

Through comparison, we find that the implementation of carbon budget in most Chinese enterprises is not as effective as that in western developed countries, and the penetration rate of carbon budget in Chinese enterprises is relatively low. Through research and analysis, we put forward the following suggestions:

1. Pay attention to carbon budget legislation and complete the legal system.
   Britain is the first country in the world to legislate against climate change. In November 2008, the UK Climate Change Act was officially signed into force, making the UK's regulatory work in related fields on the road of legalization. The bill's core clause is the carbon budget. The bill covers industries such as industry, energy, transportation, construction and agriculture, and requires each industry to make its own carbon budget.

2. Implement tough carbon reduction policies.
   With the completion of carbon budget as the core, the British government has established an energy conservation and carbon reduction policy system, and has successively issued five major policies: climate change tax, greenhouse gas emission trading system, climate change agreement, carbon emission reduction commitment and minimum carbon price system.

3. Vigorously develop the policy implementation and supervision mode of government purchasing third-party services
   In recent years, under the guidance of the new public management theory, it is the general trend for the government to purchase services from third-party institutions. The British Carbon Trust is a typical case of assisting the government as an independent institution to improve energy efficiency and reduce carbon dioxide emissions in the country.

4. Improve the basic capabilities of domestic scientific research, information collection, data statistics, etc.
   Western countries developed earlier, information system is perfect, data statistics ability is strong, such information conditions are conducive to the steady progress and gradual improvement of carbon budget.

At present, China has stepped into the stage of exploration and implementation in terms of carbon budget and carbon emission reduction, which only depends on its own research for a long time and has no obvious effect. Therefore, Chinese enterprises can learn from the implementation and formulation of carbon budget in western developed countries and improve and upgrade according to their own actual situation, which can shorten the research time and obtain better results.
References


