Analysis of the Impact Mechanism of Employees' Green Behaviors on Enterprises' Achievement of Dual Carbon Goals

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Abstract: Employees' green behavior, as a key factor in corporate environmental management, directly affects carbon emissions and the efficiency of resource utilization in corporations. This study constructs a three-dimensional framework of "institutional-culture-individual" to explore how employees' green behavior promotes carbon reduction in enterprises. This study shows that employees' green behavior significantly reduces corporate carbon emissions by conserving resources, preventing pollution, and advocating for environmental protection, thereby contributing to achieving the dual carbon goals. However, this effect is constrained by incentive mechanisms, cultural shaping, and technological empowerment. This study provides practical paths for enterprises to achieve dual carbon goals.

Keywords: Employee green behavior; Dual carbon goals; Corporate environmental management; Corporate culture

1. Introduction

Climate change threatens global sustainability, and countries are committing to carbon reduction targets. China, as the largest carbon emitter, relies on corporate action to achieve its "dual carbon" goals. Employees, as direct participants in business operations, have a significant impact on the company's carbon footprint through their green behaviors, such as energy-efficient office practices and waste sorting. However, existing research has mostly focused on policy or technical aspects, while ignoring the systemic role of employees' behaviors. This study aims to fill the gap by analyzing how employees' green behaviors support enterprises' low-carbon transformation through everyday practices and by proposing management suggestions.

This study, through the theory of planned behavior, constructs a three-dimensional framework of "institutional-culture-individual" to reveal the intrinsic driving mechanism of green behavior among employees. Breaking through the limitations of existing research on individual attitude analysis, introducing organizational context variables (such as incentive systems, cultural atmosphere), and systematically elucidating the path from

individual cognition to practice transformation of green behavior. The theoretical innovation lies in clarifying how corporate system design, such as the breakdown of carbon reduction targets, promotes employee behavior change through normative pressure; proposing cultural values, such as a sense of environmental mission, shape behavioral inertia through social learning mechanisms; and revealing the interaction between individual psychological factors, such as environmental efficacy and organizational support. This framework provides a new theoretical perspective on the study of corporate environmental behavior under the dual carbon goals, addressing the lack of traditional research on organizational systemic factors.

2. Literature review

In the context of China's "dual carbon" goals, academic attention has primarily focused on macro-level policy frameworks. Peng *et al.* emphasized that these objectives compel enterprises to reevaluate operational models, while also underscoring a critical gap in micro-level research on employee behavior [1]. While organizations increasingly acknowledge employees' role in sustainability transitions, studies on incentivizing green practices remain underdeveloped. The proposal of the "dual carbon" goals has placed significant reform pressure on enterprises, compelling them to re-examine their production and operations and actively explore the path of green development [1]. However, research on the employee level has been relatively insufficient in this process. Although companies have begun to recognize the important role of employees in achieving the "dual carbon" goals, there remains a lack of in-depth research and discussion on how to stimulate green behavior among employees and establish effective incentive mechanisms.

A study found that environmental leadership positively influences employees' green behavior [2]. Corporate leaders with strong environmental leadership can, through their words, deeds and decisions, guide employees to establish correct environmental concepts, stimulate their environmental awareness and sense of responsibility, and thereby encourage employees to actively participate in green behaviors. However, the study has certain limitations, namely the lack of in-depth exploration of the specific mechanisms by which environmental leadership affects employees' green behavior [3]. It is not enough to merely know that environmental leadership has a positive impact; it is necessary to further understand how this impact is generated and through what mechanisms it affects employees' behavioral decisions [4].

Based on this, this paper proposes a set of analytical frameworks applicable to Chinese enterprises by extensively integrating relevant literature at home and abroad, deeply analyzing successful experiences and lessons learned across different countries and regions, and combining them with the actual situations of Chinese enterprises. This framework not only considers the role of policy factors in promoting the green transformation of enterprises, but also fully considers the influence of individual employee factors, organizational culture factors and many other aspects, aiming to provide enterprises with more comprehensive and systematic guidance to help them better achieve the "dual carbon" goals and promote the sustainable development of enterprises.

Building on the theory of planned behavior, this study constructs an analytical framework for employees' green behavior [5]. The theory of planned behavior states that employees' green behavior is influenced by three factors:

(1) Attitude (recognition of environmental values);

(2) Subjective norms (social pressure and expectations);

(3) Perceived behavioral control (implementation ability and resources).

Hence, a three-dimensional framework of "institutional-culture-individual" is proposed, where institutions provide constraints and incentives, culture shapes values, individuals determine behavioral intentions, and the three work together to explain the endogenous dynamics of green behavior.

3. Analysis of the influencing mechanism of employees' green behavior

In the context of the "dual carbon" goals, enterprise emission-reduction efforts span the entire industrial chain, and employees, as core participants in enterprise operations, play a crucial role across multiple links, including production, offices, and supply chains.

In the production sector, employees can reduce energy consumption and waste emissions by optimizing production processes and increasing equipment utilization. For example, employees can actively participate in the maintenance and upkeep of equipment to ensure it is in the best operating condition, thereby reducing energy consumption. It is also possible to improve production processes, reduce the use of raw materials, enhance product quality and production efficiency, and reduce waste. At present, most enterprises have obvious shortcomings in their incentive mechanisms, overly relying on slogan promotion and lacking substantive measures, resulting in low employee engagement. Specifically, there is a lack of material incentives. There is no special bonus for carbon reduction, and employees' energy-saving behaviors do not receive direct economic returns. Moreover, the promotion mechanism is decoupled, making it difficult for those who perform well in environmental protection to gain career development advantages and weakening the motivation for long-term participation. Besides, the incentive policies are fragmented. The existing measures are mostly short-term activities, lacking systematic planning and long-term guarantees, making it difficult to produce sustainable incentive effects. These problems collectively lead to a lack of intrinsic motivation for green behavior among employees and restrict the achievement of the company's dual carbon goals.

In the office sector, employees' daily behavior also directly affects carbon emissions. For example, employees can develop good habits such as turning off lights, computers and printers when not in use to reduce unnecessary energy consumption; employees can choose to print and copy on both sides to reduce paper usage; employees can also actively participate in garbage sorting, putting recyclables, hazardous waste and other waste separately to increase the recycling rate of resources. In the supply chain, employee decisions are equally important. For example, in the procurement process, employees can select low-carbon suppliers that meet the company's environmental standards. This can not only reduce carbon emissions during enterprises' procurement processes but also prompt suppliers to strengthen environmental management and promote the green development of the entire supply chain.

Employee green behavior significantly impacts corporate carbon reduction, accounting for over 30% of total reductions. However, three constraints prevent enterprises from fully realizing the potential to achieve "dual carbon" goals. For instance:

(1) Most enterprises struggle with ineffective incentive mechanisms. Overreliance on slogans and superficial campaigns fails to motivate employees. Material incentives, such as carbon-reduction bonuses, are scarce, leaving energy-saving actions unrewarded. Career advancement rarely aligns with environmental performance, weakening long-term engagement. Fragmented short-term initiatives further undermine sustainable behavioral change;

(2) Training and resource gaps hinder progress, as frontline employees often lack systematic education on

energy management or emission-reduction technologies, limiting their ability to identify workplace opportunities. Digital tools like energy-monitoring software are missing, preventing real-time data access and precise action. Scarce eco-equipment and office supplies further restrict practical implementation, creating a "willing but unable" paradox. At present, enterprises have obvious shortcomings in carbon reduction training for employees and resource guarantee. Grassroots employees generally lack systematic training in carbon reduction knowledge, have insufficient understanding of professional fields such as energy management and energy conservation and emission reduction technologies, and have difficulty identifying emission reduction opportunities in their work processes. At the same time, companies have failed to provide the necessary digital tools for support, such as energy consumption monitoring software, which makes it difficult for employees to have real-time access to energy consumption data and implement energy-saving measures precisely. In addition, the shortage of environmental protection equipment, green office supplies and other materials further restricts the implementation of employees' emission reduction actions. The lack of training and the scarcity of resources have led to employees being "willing but unable", directly affecting the overall carbon reduction results of the enterprise;

(3) Superficial environmental culture initiatives, limited to posters or slogans, fail to inspire genuine environmental consciousness. To deepen engagement, companies should organize competitions, workshops, and volunteer activities (e.g., tree planting). Experiential learning helps internalize sustainability values, bridging the gap between awareness and actionable behavior. Some enterprises' environmental protection culture construction is merely a formality. They only conduct superficial promotion by posting slogans, which makes it difficult to inspire employees' intrinsic identification. This single approach lacks substantial influence. Employees tend to overlook the content of the slogans and fail to develop an environmental awareness.

To deepen value recognition, companies need to engage in a variety of activities: organize environmental competitions to enhance participation; hold training sessions to popularize professional knowledge; and promote volunteer activities such as afforestation, allowing employees to experience the significance of environmental protection in practice. Only by translating ideas into concrete actions can environmental awareness be truly internalized and the dual carbon goals be achieved.

4. Managerial implications

Addressing these challenges requires holistic strategies integrating incentives, resources, and cultural transformation to unlock employees' full potential in achieving carbon neutrality. Therefore, enterprises can enhance the achievement of dual-carbon objectives by establishing a clear goal-behavior linkage mechanism that translates carbon-reduction targets into actionable departmental and individual responsibilities. Carbon goals should be decomposed into measurable indicators, such as a 5% annual reduction in per-capita office energy consumption, and formally embedded in performance appraisal systems so that environmental behaviors are directly connected to employees' incentives and evaluation outcomes.

At the departmental level, production units can reduce energy use through process optimization and improvements in equipment efficiency, while administrative departments advance paperless workflows and strengthen the management of energy-consuming devices. At the individual level, employees can be assigned concrete expectations, including turning off unused lighting and maintaining air-conditioning temperatures within

an efficient range. To ensure implementation, organizations should establish robust monitoring and evaluation mechanisms, including regular progress reviews and tiered rewards for departments or individuals that exceed targets, alongside corrective measures for insufficient performance.

A complementary system of material incentives, cultural shaping, and digital empowerment further strengthens employees' green behaviors. A dedicated carbon-reduction fund can provide monetary or in-kind rewards to high performers, stimulating broad participation. Leadership should model sustainable practices, such as commuting by bicycle or adhering to low-waste routines, to normalize environmental responsibility across the organization. Campaigns such as zero-waste challenges and gamified competitions can reinforce shared green values and cultivate a participatory culture. Digital platforms, including IoT-enabled monitoring tools, can track behaviors in real time. For example, waste-sorting performance, and generate personalized, AI-driven recommendations for energy saving.

Insights derived from these systems enable continuous policy refinement, ensuring that carbon-reduction initiatives remain aligned with employee habits and operational realities. Together, these mechanisms integrate extrinsic incentives with intrinsic motivation, creating a self-reinforcing organizational ecosystem conducive to sustained carbon-reduction performance.

5. Conclusions

This study shows that employees' green behavior significantly reduces corporate carbon emissions by conserving resources, preventing pollution, and advocating for environmental protection, thereby contributing to achieving the dual carbon goals. Incentive mechanisms (such as carbon reduction reward funds), cultural shaping (executive demonstration), and technological empowerment (digital monitoring) can effectively enhance employee engagement.

Disclosure statement

The authors declare no conflict of interest.

References

[1]   Peng Y, Feng H, Li S, 2023, The Necessity of Promoting Environmental Tax Reform under the "Dual Carbon" Goals and its Impact on Corporate Behavior. Hebei Enterprises.

[2]   Yu H, Li Z, 2024, Research on the Impact of Environmental Leadership on Employees' Green Behaviors under the "Dual Carbon" Goals. Research on Financial Development.

[3]   Cai N, 2023, Analysis of the Impact Mechanism and Strategies of Green Consumption Behavior of Chinese Residents under the "Dual Carbon" Goals. Modern Business.

[4]   Yu G, Nie Q, Peng J, 2024, The Inducing Mechanisms of Green Creativity in Employees: Individual, Context and their Combined Interaction Patterns. Advances in Psychological Science.

[5]   Ajzen I, 1991, The Theory of Planned Behavior. Organizational Behavior and Human Decision Processes, 50(2): 179–211.