

The Transformation and Development of Green and Low-Carbon Consumption under the Dual Carbon Background

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ABSTRACT

As the proportion of consumption in China's gross domestic product (GDP) increases and its role as a driving force for economic growth strengthens, the impact of consumption on the resource environment and carbon dioxide emissions is becoming increasingly evident. Production is for consumption, and consumption in turn promotes production; consumption determines production and guides the direction and development trend of production. Green and low-carbon consumption is not only the responsibility of consumers, but also puts forward higher requirements for producers: the whole process from the procurement of raw materials, product production and circulation, product use, recycling of end-of-life products and final treatment and disposal are all based on low-carbon standards, forcing the supply-side structural reform to promote green and low-carbon development. The government can guide green and low-carbon consumption by setting up incentives and constraints, increasing the supply of green products, organizing government procurement, and taking the lead in policy measures, but the fundamental measure is to raise the public's awareness of environmental protection and consciously practice green and low-carbon consumption.

KEYWORDS

Low Carbon; Green Consumption; Dual-carbon background.

1. INTRODUCTION

The report of the twentieth CPC National Congress points out that the promotion of harmonious coexistence between human beings and nature is an essential requirement for Chinese-style modernization. The construction of a modernized socialist country requires planning from the perspective of harmonious coexistence between human beings and nature, and making forward-looking, systematic, and targeted deployments, including the development of green and low-carbon industries, advocating green consumption, promoting the formation of green and low-carbon production and lifestyles, and actively and steadily advancing carbon peaking and carbon neutrality, etc. In September 2020, at the general debate of the seventy-fifth session of the United Nations General Assembly, President Xi Jinping declared that our country "strives to peak carbon dioxide emissions by 2030 and strives to achieve carbon neutrality by 2060." The "dual-carbon" goal has put forward new requirements for China's economic development approach. General Secretary Xi Jinping has repeatedly emphasized that ecological and environmental issues are ultimately a matter of development and lifestyle. Therefore, to achieve the "dual-carbon" goal, it is necessary to implement a two-way change in the two dimensions of the mode of production and the way of life, that is, from the supply side of the energy structure adjustment, economic restructuring and upgrading, and from

the demand side of the demand side of the demand to promote the transformation of domestic demand to the greening of the low-carbon transformation. Among them, green consumption transformation on the demand side is an important hand in realizing the goal of "double carbon". Green consumption, as a "consumption behavior that implements the concept of green and low-carbon in the whole process of consumption activities", emphasizes that consumers practice green and low-carbon consumption and lifestyles by purchasing green and low-carbon products and sorting and recycling garbage. Green consumption has become an important breakthrough in realizing the "dual-carbon" goal, firstly, because it can directly and effectively improve the ecology and reduce carbon emissions; and secondly, because it can force enterprises to low-carbon production and even increase carbon sinks. In addition, the essence of the "dual-carbon" goal is to realize high-quality development, which is also in line with the economic and social value of green consumption. At the economic value level, consumption has become an important driving force for economic growth. 2021 China's final consumption expenditure will contribute as much as 65.4% to economic growth, and the realization of green consumption transition is conducive to high-quality economic development. At the social value level, the development of green consumption is not only conducive to promoting consumers' understanding of and support for environmentally friendly products, reversing the traditional and conservative concept of disposable consumption, but also conducive to promoting a healthy and low-carbon lifestyle, improving the quality of life of residents, and truly practicing the theory of the "two mountains" and the concept of the "community of life".

However, compared with the structural reform of the supply side, the demand side of the green consumption transformation is slightly delayed. Some scholars have pointed out that the current poor development of green consumption in China is dragging down the green transformation on the supply side. Measured data show that the green transition index in the production sector showed a growth trend from 2004 to 2018, but the green transition index in the consumption sector showed a clear downward trend, which adversely affected the overall green transition. In this context, this paper intends to analyze the current dilemma of green consumption from the perspective of micro-consumers, based on the deviation between the theory and the status quo, and explore the relevant breakthrough path.

2. THEORETICAL FOUNDATIONS OF GREEN AND LOW CARBON CONSUMPTION BEHAVIOR

2.1. Demand utility theory: demand utility of green low-carbon products and its influencing factors

Consumption reflects the subjective utility of consumer demand, and the demand utility represents the degree of satisfaction people get from consumption, which is the result of a variety of psychological motivations, and is affected by cost-effectiveness, consumption concepts, product quality and other factors. Compared with ordinary consumption, green and low-carbon consumption requires the addition of carbon emission constraints to consumption behavior, and the incorporation of energy-saving, green and low-carbon eco-efficiency in consumers' demand utility, which involves higher costs in terms of money, energy, time, etc., and whose influencing factors tend to be more complex. According to the division of economic and non-economic factors, green and low-carbon consumption behavior is affected by economic factors such as the level of economic development, residents' income status, product prices, cost-effectiveness, etc., as well as non-economic factors such as the social environment, individual responsibility awareness, environmental attitudes, low-carbon awareness, and consumption policies. According to the division of intrinsic and extrinsic drivers, regulatory means such as incentives and constraints constitute the extrinsic drivers of consumption behavior, relying on the guidance of the government and enterprises and other subjects. Consumers' cognition, attitude, awareness and other psychological factors constitute the intrinsic drivers of consumption behavior, and it is advocated that through education and publicity, consumers' cognition

of green and low carbon and awareness of green and low carbon responsibility should be gradually improved.

2.2. Externality Theory: Positive Externalities of Green and Low-Carbon Consumption

Externality refers to the phenomenon of deviation between private interests and social interests, and private costs and social costs arising from economic behavior. The negative externality effect of ecological damage caused by high energy consumption and high emission consumption behaviors should be penalized and the cost of consumption should be increased. Green low-carbon products and services are often sold at a higher price than general products, and when individual consumers choose green low-carbon products or services, their consumption behavior will directly or indirectly promote society as a whole to reduce carbon emissions, improve the climate environment, and bring additional free environmental enjoyment to other members of society, i.e., a positive externality; therefore, it is necessary to provide positive incentive compensation to green low-carbon consumers to reduce their low-carbon consumption costs. The economic effectiveness of low-carbon consumption ensures that low-carbon consumption behavior becomes the spontaneous choice of market players.

2.3. Consumption behavior theory: green low-carbon consumption cognition and green low-carbon consumption behavior

Factors such as the price of green low-carbon products, the convenience of purchase and use, etc., will make consumers produce cognitive bias, contrary to the initial intention of low-carbon consumption, resulting in the inconsistency between the consumers' low-carbon consumption intention and the actual low-carbon consumption behavior. For the analysis of low-carbon consumption behavior, there are usually three types of research methods: First, behavioral economists Fishbein and Ajzen put forward the theory of rational behavior, that when an individual's behavioral intention for a particular behavior of its own the stronger, the greater the likelihood of the individual to implement the behavior, the implementation of the green low-carbon consumption behavior the key to strengthening the green and low-carbon cognitive education and cultivate The key to implementing green low-carbon consumption behavior lies in strengthening green low-carbon cognitive education and cultivating green low-carbon consumption attitudes. Secondly, the theory of planned behavior proposed by Ajzen (Ajzen), on the basis of the theory of rational behavior (TRA) added the individual's ability to control behavior, that the individual's ability to control behavior, subjective norms and behavioral attitudes of the three factors jointly affect the individual's behavioral intentions, emphasizing the formation of self-restraint mechanisms, establish a strong sense of low-carbon responsibility, and make clear that the individual's green and low-carbon consumption behaviors are of great significance to the society as a whole. . Thirdly, the moral norms theory represented by Stern's "Value Belief-Norm Theory" (VBN) not only emphasizes the green low-carbon awareness, ecological crisis perception, green low-carbon consumption behavior, and the ability to perceive the ecological crisis, but also emphasizes the importance of low-carbon consumption behavior to the society as a whole. The moral norms theory, represented by VBN, not only emphasizes the importance of internal factors such as green and low-carbon awareness, ecological crisis perception and green and low-carbon consumption habits, but also emphasizes the influence of external factors such as the price of green and low-carbon products, the convenience of green and low-carbon products, low-carbon social norms, and low-carbon policies.

3. CHARACTERISTICS OF GREEN CONSUMPTION IN CHINA AND EXISTING PROBLEMS

In recent years, China's consumption has been growing steadily and rapidly, its fundamental role in economic development has been significantly enhanced, and its impact on the ecological environment has become increasingly evident. China's consumption characteristics have changed significantly: the consumption level from the subsistence type to the overall well-off type change, the consumption behavior from the herd imitation type to the individuality of the experience type change, the consumption form from the material type to the service type change.

3.1. Green Consumption Lifestyle Becomes a New Trend

Overall, China's institutional framework for promoting green consumption has basically taken shape. In terms of promotional measures, China has actively promoted the exploration of green consumption (e.g. energy-saving and environmentally friendly product certification, environmental labeling certification, green supply chain, bike-sharing, etc.), which has accumulated experience in promoting the formation of green lifestyles and consumption patterns. In terms of public action, the obvious increase in public awareness of the environment, participation and rights protection, as well as the growing demands and expectations for a good quality of life, constitute the social foundation for green consumption.

People have realized the role of consumption in sustainable development, and their willingness to consume green has begun to grow. The Research Report on Low-Carbon Living and Low-Carbon Consumption Behavior of Households shows that adopting a simple, moderate, green and low-carbon lifestyle and consumption pattern is both an environmental responsibility and a wisdom of life, and is the proper meaning of a sustainable, high-quality life. Respondents who believe that low carbon can "reduce waste", contribute to "sustainable development", reduce air pollution, make life healthier, and make life simpler and more enjoyable are 41%, 33%, 32%, 33% and 25% respectively. The most widely accepted low-carbon consumption behavior occurs in the field of household appliances, as evidenced by respondents' clear preference for energy-efficient appliances (39% of respondents chose Grade 1 energy efficiency out of three energy efficiency grades), and a clear low-carbon orientation in the process of using and disposing of them. The China Consumer Survey 2022 shows that consumers are not only concerned about healthy and organic food consumption, but that "healthy and natural ingredients" have also become an important factor in product selection; about 65% of consumers habitually check food ingredients when shopping, and spending on health and lifestyle-related items has increased.

Youth are more willing to pay for green. The "Post 90s" and "Post 00s" are and will continue to be the mainstay of consumer life. In the Chinese Youth Climate Awareness and Behavior Research Report 2020, which focuses on Chinese college students aged 18-24, respondents are willing to "pay a higher price for protecting the environment", "pay more taxes for protecting the environment" and "lower their living standard for protecting the environment." The proportion of respondents who are willing to "pay a higher price for protecting the environment", "pay more taxes for protecting the environment" and "lower living standards for protecting the environment" are 68%, 62% and 57% respectively. These data fully illustrate that the youth group has a strong sense of subjective willingness to protect the environment and value judgment; but to what extent the willingness has been transformed into actual purchasing actions is an issue that needs to be seriously studied.

The role of women in green consumption is becoming more and more obvious. Women are the main body of green consumption, and a family's shopping plan and consumption are mainly done by women, with more than 60% of the consumption value realized. Studies in Organization for Economic Cooperation and Development (OECD) countries show that women are more willing to buy green products and energy-saving products. Women in developing countries are responsible for

70-80% of household shopping. Responses to questionnaires on whether household waste is sorted or not are nearly 5 percentage points higher for women than for men. Women's character, awareness and behavior will have a great impact on their children and even their families, and will play a great role in building green families.

The epidemic has triggered new features and patterns of production and consumption. The XKP epidemic has greatly impacted people's daily life experience and original knowledge system, and people have begun to reflect on the way of development, the nature of life and daily habits, and to adjust their lifestyles and consumption patterns to adapt to the new situation. During the epidemic, the production and supply of products such as masks, protective clothing and respirators to meet health needs grew rapidly; "home consumption" also emerged, and new consumption modes developed rapidly, with the popularization of online consumption, the rapid growth of online video consumption, and the rapid development of e-commerce and new retailing businesses. The online shopping industry has been introduced to thousands of households. Simple operation in apps can accomplish consumption that could only be realized by going out in the past, making middle-aged and old people also join the ranks of new types of consumption. Supported by mobile Internet technology, offline retailing has shifted to the integration of online and offline retailing, and e-commerce, mobile payment and the sharing economy have become new trends leading consumption.

3.2. Problems and reasons in China's green consumption

The effective supply of and demand for green and low-carbon products are insufficient. Some products do not meet energy-saving and environmental protection standards, and the market is not standardized enough. In addition, green food, energy-saving and environmental protection products, green buildings, public transportation and environmental labeling products have not yet become a necessity for people's food, clothing, housing and transportation.

Green low-carbon consumption awareness is relatively weak. Residents' long-standing rough consumption habits, overconsumption, extravagance and waste, and ostentatious consumption still exist to some extent, and they have not yet developed healthy, environmentally friendly and moderate consumption habits in their daily lives of clothing, food, housing, transportation and travel, which to a certain extent has resulted in huge waste of resources, environmental pollution and ecological degradation problems. Low-carbon lifestyle has also not become a social trend.

The law is not perfect. China's green consumption, is policy-led, top-down promotion, has not yet introduced a special green consumption laws. Comparatively speaking, Japan has formulated a series of laws and regulations such as the Green Consumption Law, the Low Carbon Investment Promotion Law, the Urban Decarbonization Promotion Law, and the Green Procurement Law, etc. In 2010, South Korea formulated and introduced the "Basic Law on Green and Low Carbon Growth in South Korea", which regulates the relevant contents of green and low-carbon consumption. The existing regulations in China, including the Environmental Protection Law and the Consumer Rights and Interests Protection Law, lack specific provisions on green and low-carbon consumption, and the protection of intellectual property rights is not strong enough, which affects the formation and development of the social atmosphere of green consumption.

Policy measures are insufficient. Financial and tax policies can not be fully implemented, the bidding mechanism is not sound, market supervision is not in place, publicity and promotion efforts are not enough, can not effectively incentivize and guide market players and consumers; there are also low-carbon product varieties, high prices, "good but not good" phenomenon. Part of the enterprise speculation "low carbon" concept, substandard, fake phenomenon occurs from time to time, the low cost of violation of the law, frustrate the enthusiasm of the enterprise production, but also affect the confidence of consumers. Green food, green commodity certification is confusing, but also did not play a role in improving the ability of consumers to identify the authenticity of green commodities.

Consumption is unreasonable. The current consumption of resources and environmental pressure continues to increase, but also become an important source of greenhouse gas emissions. Specifically embodied in: 1) Due to factors such as scale, structure, and consumption patterns, the demand for resources and energy in consumption continues to grow rigidly; 2) The unreasonable consumption patterns of luxury and waste have intensified the pressure on resources and environment; 3) Consumption has become an important source of solid waste generation. According to relevant statistics, by September 2020 China will produce 60 billion pieces of packaging waste, equivalent to the total amount of 2019, which not only consumes a large amount of resources, but also affects environmental health and city appearance.

Along with the completion of China's industrialization and urbanization, the consumption demand of residents' life will continue to increase. Promoting green consumption is of great significance for transforming the mode of development, increasing the supply of green products, improving the efficiency of energy use, responding to climate change, and building an ecological civilization. Green low-carbon consumption embodies a mentality, a value and a way of behavior of people, representing the harmonious symbiotic development of man and nature, the economy and society and the ecological environment, and is also the inevitable requirement of China's green low-carbon development.

4. INFLUENCING FACTORS BETWEEN GREEN AND LOW-CARBON PRODUCTION AND CONSUMPTION

On the production side, Governments influence the scale of production and use of green products through incentive/constraint mechanisms, government procurement, public education and leadership. Generally speaking, government subsidies and tax breaks and preferential policies will expand the production and consumption of green products; and the production and consumption of green products associated with regulations prohibiting the use of endangered species as raw materials, such as those prohibiting the use of rhinoceros horns and ivory in the production of related medicines, will increase. Enterprises are the main body of the market economy and the producers of green products. Whether enterprises produce green low-carbon products, by corporate social responsibility, environmental awareness, clean production and green manufacturing level, green supply chain management and other factors; at the same time, the marketing link to do a good job can quickly enhance the sales of green products, "word of mouth" will also increase the scale of sales of green products.

On the consumption side, the carbon dioxide emitted by consumption is household-based, with the microscopic characteristic of discrete distribution of point sources. Whether or not consumers consume green products is influenced by factors such as income level, education level and consumption concepts; income level determines consumers' purchasing power, while what they consume is their own choice, which is difficult to be forced by outsiders. Consumers' shopping activities and green consumption behaviors are affected by psychological influences such as willingness to choose, tendency to choose, and improvisation. Consumers in the purchase behavior of psychological activities generally have to go through a cognitive process, emotional process and volitional process - this process determines the consumer's purchasing activities, the three exist inextricably linked. (1) Cognitive process. Consumer purchasing behavior begins with cognition. Consumers from a variety of ways to obtain such as "green food", "energy-saving refrigerator" and other green commodity information, the formation of fragmented, independent and intuitive impression. With the continuous dissemination of green commodity knowledge, consumers form memory, thinking, imagination and other mental activities, green products to generate a sense of trust; in the purchase will rely on memory, including the life of the perceived commodities, experienced emotions or relevant experience, to make the decision to buy or not. (2) Emotional process. Social needs and their emotions dominate consumers' purchasing behavior. Consumers in the purchase of

goods will be governed by physiological needs and social needs, and produce emotional changes in the purchase of goods or not: such as the emergence of emotional response to meet their own consumption needs, resulting in a positive attitude of pleasure, joy, etc., will stimulate the purchase behavior. On the contrary, if you can not meet their own consumption needs will produce aversion, there will be no desire to buy. (3) Will process. In the purchase of activities, consumers show a purposeful conscious domination, regulate their own behavior, and strive to overcome psychological and emotional barriers to achieve the established purpose of the process; this is the consumer's psychological activities of the will process. This process has two basic characteristics: a clear purchase purpose; eliminate interference and difficulties, to achieve the established purpose.

5. POLICY RECOMMENDATIONS TO PROMOTE GREEN AND LOW-CARBON CONSUMPTION

5.1. Strengthening top-level design and expanding the effective supply of green and low-carbon products

The top-level design of green low-carbon consumption should be strengthened. The top-level design should not only be "heavenly", conforming to the international trend of green and low-carbon development, and in line with the national policy direction; it should also be "grounded", so that the work can be grasped and the results can be seen. In other words, both the theory of the "lofty", but also the operability of the task. Consumption is both the end point and the starting point of new production, is to release the potential of China's domestic demand, enhance the momentum of economic development focus. To advocate civilization, saving, green, low-carbon consumption concept, and promote the formation of green low-carbon lifestyle and consumption patterns compatible with China's national conditions. Green and low-carbon consumption should be incorporated into the national economic and social development plans of national and local governments at all levels, and into the overall layout of the "Five-in-One"; the guiding ideology, basic principles and target indicators of green and low-carbon consumption should be put forward, and the key tasks on the supply side of green consumption should be planned, including green design, cleaner production in industry, industrial circular economy, prevention and control of industrial pollution, cleaner and lower-carbon energy consumption, and the development of a green and low-carbon consumption policy. It will also plan key tasks on the supply side of green consumption, including green design, industrial clean production, industrial circular economy, industrial pollution prevention and control, clean and low-carbon utilization of energy, green development of agriculture, green development of the service industry, expansion of consumption of green products, and green lifestyles. Specialized plans should also be prepared to study and put forward stage-by-stage goals and tasks, strengthen supply-side structural reform, improve the production capacity of green and low-carbon products, clarify the division of responsibilities among relevant departments, and systematically coordinate and promote the sustained and healthy development of green and low-carbon consumption in an integrated manner.

5.2. Implementing the strategy of expanding domestic demand and raising the public's level of green consumption

The overall policy orientation is to raise the income level of the low-income group, expand the size of the middle-income group, and curb the luxury consumption orientation of the high-income group. (1) Utilize the "seed" role of public finance. Guide enterprises and social investment, encourage residents to expand consumption, and rely more on domestic demand, especially consumer demand to drive economic growth. Expanding domestic demand is not only to enhance the main domestic cycle of the requirements of the main position, is effective in the weakening of the role of external demand, the inevitable choice to seize the initiative to develop, but also to improve the level of green

consumption prerequisites. (2) Enhance consumption, especially green consumption on economic growth. Open up the blockages and pain points restricting sustained economic growth, and cultivate new types of consumption such as rural e-commerce, online retailing, Internet medical care, and smart tourism. (3) Improve the income distribution system. Improve the income of low-income groups, raise the proportion of labor remuneration in the initial distribution, improve the multi-level social security system, and enable the masses to have the ability to consume. Focusing on promoting low-income people into the middle-income group, and addressing urban and rural population mobility and social security, improve the level of public services such as education, medical care and social security, and reduce the pressure on the lives of residents. (4) Expand the size of the middle-income group, forming an olive structure with two small ends and a large center. The middle-income group has a higher marginal propensity to consume, and is the main force in the consumption of middle- and high-end commodities and services, such as purchasing houses and cars, medical care and education, and leisure and tourism, and is the backbone of leading the upgrading of the consumption structure to high-end, service-oriented, diversified and personalized. Increase the regulation of taxation, social security, transfer payments, etc., to curb wasteful and unreasonable consumption, and make the people willing to consume, able to consume and dare to consume through policy guidance and regulation.

5.3. Improve policy measures and increase support for green and low-carbon consumption

(1) Improve industrial policy. Expanding the supply of green low-carbon products is a direct requirement for the production side; only by expanding the supply of low-carbon products and lowering the prices of low-carbon products can we accelerate the formation of a low-carbon lifestyle. Implement a differential tariff policy for high energy-consuming industries and restricted and eliminated enterprises, and implement a punitive tariff policy for those whose energy consumption exceeds the energy and electricity consumption limit standards. The implementation of energy-saving technological transformation to reward instead of subsidy policy, and according to the actual energy savings awarded; the implementation of the "frontrunner" program, the implementation of energy-saving products to benefit the people's project, the best energy-efficient products and equipment to give incentives; the implementation of residential electricity ladder prices. (2) Implement tax incentives, improve the differential pricing mechanism, promote energy-saving low-carbon technologies, the introduction of green equipment, improve energy production, conversion and use of efficiency. (3) Encourage consumers to use energy-saving, water-saving and environmentally friendly products, energy-saving and environmentally friendly automobiles, and energy-saving and land-saving residences; reduce the use of disposable products; limit excessive packaging; and curb unreasonable consumption. (4) Improve the extended producer responsibility system, and clarify the target responsibility of producers for the life cycle of products, i.e., from eco-design, product development, production and processing, sales and after-sales service to product recycling and waste disposal, producers bear the corresponding responsibility. (5) Improve the government's green procurement policy, increase the government's procurement of green and low-carbon products, and gradually increase the proportion of energy-saving, water-saving and recycled products.

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