

# ***Research on the Green Development of E-Commerce Economy Based on E-Commerce Platform***

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**Abstract:** While innovating global trade and service models, driving profound changes in business models and consumer behaviors, the e-commerce economy is also accompanied by problems such as resource consumption and environmental pollution, which have aroused people's concern and profound thinking about sustainable development. In this context, green development has gradually become a global consensus. It has become an urgent research topic to correctly understand the relationship between them and integrate green concepts into the development of the e-commerce economy to achieve the dual goals of economic benefits and environmental sustainability. This paper selects two major e-commerce platforms, Amazon and JD, as cases, summarizes the current situation of e-commerce platforms and green development, reveals the relationship between the two, points out the challenges faced, and puts forward corresponding solutions, emphasizing the importance of technological innovation, policy guidance, consumer behavior education, and win-win cooperation. This paper reviews the state of e-commerce platforms and sustainable development, highlighting the linkage and addressing challenges with proposed solutions, underscoring the roles of tech innovation, policy, consumer education, and a collaborative strategy. This helps to highlight the vital role of e-commerce platforms in global economic growth and business innovation, increase their emphasis on environmental protection and social responsibility, and promote future paths and prospects in achieving long-term sustainable development goals.

**Keywords:** Green development, E-commerce economy, E-commerce platform.

## **1. Introduction**

The speedy development of the e-commerce economy, that is, the use of the Internet to trade goods and provide service activities, is an important feature of the development and further development of international economic activities in recent years and is a key force to promoting global economic growth, foster business innovation, and influence consumer consumption behavior. The Internet, payment gateways, data analysis, and automation play a dominant role in the rapid development of the e-commerce economy. The e-commerce economy has promoted the birth of novel Business models such as Business-to-business (B2B), Business-to-consumer (B2C), and Consumer-to-consumer (C2C). At the same time, to conform to global sustainable development, the rising trend of green economy, and the realization of international fairness and justice, the concept of green development advocates a more harmonious and durable economic growth mode. It become one of

the important concepts to promote high-quality economic development around the world, helping to achieve long-term economic prosperity. Many countries have accelerated the pace of technological and institutional innovation, clarified the goals and strategies of green development, stressed the importance of green industries, and actively explored and practiced in many aspects such as clean energy and green transportation.

Firstly, e-commerce represents a new model of business, that is, by changing the medium of business operation to carry out economic business, and can build trade networks to connect remote areas, thereby improving economic efficiency, industry competitiveness, and company profitability, and promoting the development of the information society [1]. Recently, the development state of the global e-commerce economy has shown a rapid expansion trend accompanied by rich and diverse characteristics. According to the study, global e-commerce sales will reach \$3.6 trillion in 2023, and are expected to continue to show growth in the following years, are expected to grow 8% to \$3.9 trillion in 2024, and will reach \$5.0 trillion in 2028 [2]. The e-commerce market shows a diversified trend, including live shopping, interactive video marketing, etc., which greatly improves trade efficiency and the shopping experience of consumers. In terms of shopping experience, for example, in the past, customers wasted a lot of time and energy going to physical stores for traditional shopping, however, with the advent of electronic marketing, customers can give up the usually exhausting trip to the supermarket and turn to the convenient and fast online shopping [3]. People are happy to enjoy the seamless operation and multiple payment options offered by companies as a result of the e-commerce economy and are pleased to apply more functions that are accessible online [4].

In addition, at present, the global attention to the world green economy has reached a new height and become the core of the international community. According to the authoritative view of the United Nations Environment Program, the green economy is described as a development model characterized by low carbon emissions, improved resource utilization, and strong social inclusiveness, and defined as an industry that improves human happiness and social justice, the key is to curb environmental harm and the depletion of ecological resources [5]. Countries believe that with the continuous growth and changes of the global e-commerce market, as an emerging industry, the e-commerce industry also needs to adapt to the requirements of green and low-carbon development to achieve sustainable future construction. Policymakers, academia, and business, among others, are recognizing the growing environmental impact and concern in both developed and developing economies, which has led to the development of unique solutions that apply to business operations and integrated into everyday activities to reduce the burden on the planet [6]. They believe that in the medium to long term, sustainable development and socially responsible organizational behavior can catalyze not only the productivity of the company but also the macro-level potential of the entire industry [6]. There is a growing awareness that enabling regions to focus on the best ways to produce and ensuring that they can rely on trade relationships to buy goods they do not produce is one of the advantages of green economy globalization [7]. The results of the survey revealed that the expansion of the e-commerce industry effectively contributed to a significant reduction in carbon emissions through the analysis of OLS and 2SLS statistical models [8]. To help achieve a green economy and reduce their carbon footprint, companies are also taking corresponding measures. For example, the government wants to use laws and policies to further promote e-commerce platforms to adopt solutions such as creative packaging to achieve their goals [9]. Because of the increasing awareness of environmental protection, especially the high demand for green packaging, e-commerce companies are actively seeking sustainable solutions, aiming to achieve the dual goals of reducing costs and responding to the call for green consumption, building a harmonious relationship between economic efficiency and ecological responsibility [10]. Alibaba, JD, and other e-commerce platforms have indeed made remarkable progress in energy conservation, carbon reduction, and green transformation of the supply chain, enhancing the environmental awareness of e-commerce enterprises, improving

their competitiveness, and playing a vanguard role in the green transformation of the e-commerce economy.

In short, the green development of the e-commerce economy is a multi-faceted and multi-level process, which requires the joint efforts of platforms, the technological innovation of enterprises, policy support, consumer participation, and international cooperation to achieve a more sustainable and environmentally friendly development model on a global scale.

Through the analysis of practical cases of e-commerce economies, the relationship between e-commerce platforms and green development is deeply discussed, which highlights the indelible role of e-commerce platforms in economic growth and business model innovation and change, and at the same time enhances the environmental awareness of e-commerce enterprises and the public, and enhances the sense of social responsibility. In this process, the main difficulties and challenging problems faced by e-commerce platforms in the process of promoting the development of a green economy are found, the root causes are reasonably analyzed, targeted solutions are proposed, and specific directions for achieving long-term green development goals in the future are discussed, providing guidance and reference for the economic prosperity flourishes in an eco-friendly environment of the e-commerce industry.

## **2. Case Analysis**

### **2.1. Amazon Green Development Practice**

The efforts and achievements of the platform in green development have enabled it to occupy a leading position in the international e-commerce field and make a commitment to sustainable development. Green development of Amazon practices involves products, raw material procurement, equipment, and other aspects.

#### **2.1.1. Products**

Top management expects Amazon products to build a highly socially responsible and environmentally sensitive supply chain and make a unique contribution to the green circular economy. The platform staff carefully selected product categories and assessed product life cycles to reduce the risk of deforestation for food, grocery, and consumable private-label products containing ingredients such as palm oil, paper, cocoa, and tea [11].

#### **2.1.2. Raw Material Procurement**

Amazon updates its standards for raw material procurement. For instance, the cocoa products that are acquired must be verified by third parties (like Cocoa Horizons) to meet sustainability requirements; Where there is little chance of deforestation or where the supply chain is completely traceable, beef is produced [11].

#### **2.1.3. Devices**

Making each generation of Amazon devices more energy efficient than the last is company goal. In 2020, Amazon stood out as the first consumer electronics company to solve the power problem of its devices through renewable energy development. To ensure product quality and performance, and throughout the concept of environmental friendliness, Amazon has innovatively integrated the life cycle assessment of mechanical equipment into the design process to improve the energy efficiency of equipment [11]. This initiative helps Amazon measure carbon emissions at all stages from manufacturing, to customer use, and then to product recycling and disposal, and achieve energy conservation and emission reduction goals.

## **2.2. Green Development Practice of JD**

As an e-commerce enterprise, JD adheres to the innovation-oriented, green, and low-carbon business model, based on which it builds its supply chain and promotes sustainable consumption, to achieve green and circular economic development [12]. The green development strategy of the JD platform covers warehousing, transportation, packaging, marketing, and other aspects.

### **2.2.1. Storage**

JD adopts green infrastructure construction and carbon reduction technology innovation, builds green low-carbon warehousing and logistics parks, leads by example, actively promotes the green construction of the industry, and becomes a leader in the construction of green warehousing systems. For example, JD became the first company in China to build a distributed photovoltaic energy system, building several smart industrial parks, sorting centers, large warehouses, and paving roof PV in the logistics park, with a total installed capacity of 114.48 MW, enabling it to reduce carbon emissions by 27,000 tons in 2023 [13].

### **2.2.2. Transportation**

JD Logistics promotes a variety of green transportation modes such as new energy vehicles, hydrogen energy heavy trucks, and unmanned vehicles. By the end of 2023, JD Logistics has invested more than 8,000 road capacity self-operated new energy vehicles in the trunk and terminal transportation links, achieving an average annual carbon emission reduction of more than 35,000 tons of carbon dioxide equivalent [13].

### **2.2.3. Packaging**

JD promotes the innovation of packaging technology, strengthens the technological innovation and application of green packaging materials, and explores the fine operation of circular packaging. By the end of 2023, nearly 70,000 tons of carbon emissions will be reduced through packaging carbon reduction; JD Logistics also implemented the original straight packaging certification standard, reducing the use of secondary packaging by more than 800 million [13].

### **2.2.4. Marketing**

JD has integrated the concept of green development into its brand image, promising sustainable economic development and focusing on environmental protection. This approach not only helps to enhance the brand image but also appeals to consumers who are highly environmentally conscious. At the same time, when promoting products, JD will also emphasize those with green characteristics or meet environmental protection standards. This includes products produced using renewable energy, organic products, products made from recycled materials, etc.

## **3. The Relationship between E-commerce Platforms and Green Development**

### **3.1. The Role of E-commerce Platforms in Green Development**

The significant features of the e-commerce economy include its digitalization itself, immaterial form, and personalized customized services. These features work together to help the economic model transcend the limitations of time and space, transform into the network, build a bridge of direct communication and dialogue between producers and consumers, minimize the waste of resources in the intermediate links of the traditional model, and then improve economic efficiency and achieve

the goal of environmental protection. And have an encouraging impact on the sustainable development of society [14]. In essence, the e-commerce economy, driven by technical information, uses the digital convenience of the e-commerce platform to inject new impetus and possibilities for green development. At the same time, the e-commerce economy has given birth to such e-commerce platforms, and the expansion of online trading platforms is the inevitable development of the current era, through the optimal allocation of resources, reducing the environmental costs and problems of entity operations, reflecting the essence of green economic development, and meeting the needs of the global pursuit of green sustainable development. In short, there is a symbiotic relationship between e-commerce platforms and green development to some extent, which complement each other and achieve each other.

### 3.1.1. Supply Chain

E-commerce platforms work with suppliers to jointly invest in environmental technology and equipment upgrades, not only ensuring the green and sustainable nature of their supply chains but also leading the transformation of the entire industry to eco-friendly and sustainable, demonstrating synergies. For example, JD has implemented the "Green Flow Plan" to promote the development of a green supply chain. Its core is to provide enterprises in the consumer goods industry with standardized products + customized service content of supply chain integration service solutions, to help enterprises in the process of supply chain optimization and market channel change to cut down costs and boost efficiency, and improve consumer service experience in an all-round way [13].

### 3.1.2. Production

The e-commerce platform promotes green production standards and manufacturing products that align with environmental protection criteria. For example, given the waste generated in the production process, JD Logistics established the "Solid waste Control Procedure" and scrap disposal process: General waste is mainly sorted and disposed of by the factory waste, and then disposed of by the property of the park. For hazardous waste (such as WD40 rust remover, self-painting, etc.), it is handed over to qualified third-party organizations for regular cleaning and disposal, and recorded in the national hazardous waste disposal system [13].

In addition, the e-commerce platform provides technical and financial support, adopts more environmentally friendly production technology and equipment, and achieves a win-win situation of economic and environmental benefits. For example, to provide a more sustainable and economical production process, Amazon has incorporated the life cycle assessment of high-quality equipment into the design process [11].

### 3.1.3. Sales

The e-commerce platform can establish a product recycling system to encourage consumers to return old products, and the platform or partner manufacturers are responsible for renovation, repair, or reproduction, extending the service cycle of items and curbing the generation of waste. The packaging management strategy of JD focuses on the four dimensions of reduction, reuse, recycling, and degradation, and is committed to the greening of packaging. By the end of 2023, this strategy has helped to reduce carbon emissions by about 69,515 tons [13].

In addition, e-commerce platforms play a guiding role in green consumption. Given its strong information dissemination ability, the concept of green marketing has been widely disseminated, deepening the public understanding and recognition of the concept of environmental protection and green development, increasing attention to environmental issues, and giving birth to a lifestyle advocating green and low-carbon consumption. It has subtly reshaped consumer shopping habits,

promoted online consumption, and reduced the environmental costs of physical stores, such as commercial electricity and space. With its low marginal cost, e-commerce provides enterprises with the opportunity to break through restrictive factors such as capital, land, labor, and technology, and reduce the adverse impact of cost on the environment [14].

### **3.2. E-commerce Platforms Face Challenges under the Requirements of Green Development**

#### **3.2.1. Excessive Energy Consumption**

The expansion of the e-commerce market cannot be separated from the construction of Internet infrastructure. E-commerce platforms rely on data centers to store and process data, requiring large amounts of electricity to run and cool servers, resulting in huge energy consumption. With the growth of business volume, data scale, and energy consumption are also on the rise. For example, in China, in 2022, the national data center power consumption reached a staggering 270 billion kilowatts, accounting for about 3% of the whole societal electricity consumption, with the acceleration of the pace of Internet digitization, it is expected that by 2025, China data center power consumption in the whole societal electricity consumption will climb to 5%. By 2030, data center power consumption in China will be close to 400 billion kilowatts, and data center emission reduction is imminent [15].

#### **3.2.2. Carbon Emissions**

At present, the main means of logistics transportation are still medium and large trucks driven by traditional energy, which rely on a large amount of oil and natural gas as a power source [16]. Especially with the surge in commodity transactions, the number of vehicles transported and the distance traveled are also rising, resulting in a sharp increase in fuel consumption and carbon emissions.

#### **3.2.3. Packaging and Waste Disposal**

With the quick growth of business volume, the amount of packaging waste is also increasing sharply. At present, in China, the express delivery industry consumes about 9 million tons of paper waste and 1.8 million tons of plastic waste each year, and the accumulation is accelerating. This not only increases the burden of municipal solid waste management but also may lead to land pollution and ecological pollution.

At the same time, although some e-commerce platforms have begun to promote recyclable or recyclable packaging, consumers are still weak in their awareness of green environmental protection, lack of awareness of packaging waste classification and recycling, and the recycling mechanism is not sound, resulting in poor recycling effect and failure to give full play to due environmental benefits.

### **4. Suggestion**

Given the challenges faced by e-commerce platforms under the requirements of green development, the following targeted recommendations are proposed:

First of all, for the problem of high energy consumption, e-commerce platforms should invest in efficient data center design and operation, use the Internet and big data to integrate green consumption information base, optimize data center energy efficiency, actuarial resource allocation, curb redundancy, and waste, and reduce energy consumption. At the same time, based on geographic information, professional and technical personnel are sent to rationally investigate and evaluate the regional environment to reduce environmental costs. E-commerce platforms should also strengthen collaboration with suppliers, accurately match supply, control order costs, and customize production



on demand, for example, Uniqlo, Nike, and other brands for pre-sale, to reduce resource waste, unnecessary energy consumption, and environmental load caused by overproduction.

Secondly, for the problem of carbon emissions, it is recommended to promote the use of electric or hybrid transport vehicles and gradually get rid of the dependence on fossil fuels. Intelligent algorithms are used to optimize distribution routes, reduce the empty rate of vehicles, and rationally select warehouse locations based on consumption preferences to reduce transportation mileage and fuel consumption. The government works with e-commerce platforms to implement carbon emission monitoring systems, set emission reduction targets, and rely on technological innovation and management optimization to reduce carbon footprints.

In addition, for packaging and waste disposal difficulties, the platform can use biodegradable and recyclable packaging materials, reduce packaging pollution to the environment from the source, and use marketing activities to educate consumers about the importance of environmentally friendly packaging. Join hands with government departments, formulate relevant policies, and learn from the experience of second-hand platforms such as Xianyu, establish a sound packaging waste recycling system, stimulate public enthusiasm, improve consumer participation and recycling awareness, and facilitate the development of the green circular economy.

In general, e-commerce platforms need to cultivate green consumption patterns and build a low-carbon and sustainable e-commerce ecological environment through technological innovation, policy guidance, consumer education, and win-win cooperation.

## 5. Conclusion

By introducing the current status of e-commerce platforms and green development, this paper takes Amazon and JD as examples, elaborates on the practical cases of e-commerce platforms in green economy development, and reveals the relationship between them. The role of e-commerce platforms in green production, promoting green distribution, improving green consumption, and the difficulties faced by e-commerce platforms in energy consumption, carbon emission, packaging, and waste treatment are specifically analyzed, providing a theoretical and practical reference for sustainable development of the e-commerce industry.

It is undeniable that the e-commerce economy has not only changed the traditional business operation mode but also profoundly affected the promotion of global economic growth and business innovation. Therefore, it is more necessary to focus on the specific performance of e-commerce platforms under the green development of the times. Overall, the significance of this article is to highlight the need for the e-commerce economy to pay attention to environmental protection and social responsibility while driving global economic growth and business innovation. Through technological innovation and green practices, e-commerce platforms can achieve win-win economic and environmental benefits and contribute to sustainable development.

In the future, e-commerce platforms need to continue to innovate, strengthen international cooperation, and promote the green development of the entire industrial chain. At the same time, e-commerce platforms also need to actively face new challenges and be good at finding solutions through technological innovation and management optimization. In short, it is believed that with the continuous progress of technology and the support of policies, e-commerce platforms are expected to achieve greater achievements on the road to green development and achieve greater sustainable development goals.

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