

Recycled Resources in Green Express Delivery: Socio-Economic Value Challenges and Solutions

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Abstract. The global express delivery industry has experienced unprecedented expansion over the past decade, becoming a vital pillar of global economic integration. While significantly facilitating commercial activities and consumer convenience, this rapid growth has concurrently triggered a severe environmental crisis, primarily due to the massive accumulation of packaging waste. This article systematically investigates the socio-economic value of recycled resources within the international green express delivery sector. Utilizing a systematic analytical methodology, the study delves into the current utilization status, identifies multifaceted barriers, and explores viable solutions on a global scale. Our analysis reveals that the principal obstacles hindering value realization include inconsistent international policy standards and regulatory frameworks, significant technological bottlenecks in recycling and material performance, a pronounced cost-benefit imbalance for enterprises, and insufficient levels of consumer awareness and participation. To address these complex challenges, this paper constructs a comprehensive, multi-dimensional analytical framework. Based on this framework, it proposes a suite of integrated strategies encompassing enhanced international policy coordination and harmonization, accelerated technological innovation and adoption, optimization of market mechanisms and economic incentives, and the strengthening of global cooperation and knowledge sharing. The findings of this research are intended to offer a robust theoretical foundation and actionable practical guidance for stakeholders—including governments, corporations, and international bodies—to collaboratively promote the sustainable development of the environmentally friendly express delivery industry, ultimately facilitating a win-win scenario for both economic prosperity and environmental stewardship.

Keywords: Environmental Protection, Express Delivery, Recycled Resources, Social Value, Economic Value

1. Introduction

The global express delivery industry, as a crucial pillar of the globalization process, has witnessed unprecedented growth over the past decade. However, this expansion, while promoting economic activities and convenience, has also triggered a severe environmental crisis. The sharp increase in the volume of discarded packaging materials has become an undeniable ecological burden.

According to data from the National Post Bureau, the volume of express delivery services in China rose from 5.6 billion items in 2012 to 40 billion items in 2017, generating a massive amount of packaging waste. This linear economic model generates a large amount of cardboard, plastic, and filling materials at each stage, from collection and packaging to distribution and disposal, causing significant negative externalities. Against this backdrop, the circular economy model that redefines waste as recycled resources points the way for industry transformation. Studying the social and economic value of recyclable resources in the green express delivery industry is of great significance for promoting sustainable development in the industry and realizing the concept of business for good.

At present, scholars both at home and abroad have begun to pay attention to the issue of express packaging waste. The report pointed out that the current express industry in China is faced with problems such as excessive packaging and waste of resources, high production costs of eco-friendly packaging, lack of awareness of express packaging recycling in society, and high recycling costs [1]. The School of Public Administration of Renmin University of China conducted a specific analysis of the Miluo recycling industry using the SWOT analysis method and proposed a development strategy for making the Miluo recycling industry bigger and stronger [2]. Internationally, against the backdrop of the continuous growth of packaging waste in the European Union and the failure to achieve the goals set by the Packaging and Packaging Waste Directive, the European Commission issued the Packaging and Packaging Waste Regulation [3], the United States implemented the Resource Conservation and Recovery Act to promote packaging recycling [4], and Japan introduced the Packaging Recycling Act to clarify the responsibilities of all parties [5]. However, existing research mostly focuses on a single country or region, lacking a systematic analysis of the realization of the value of recyclable resources in the international context of the eco-friendly express industry, especially in the research on the synergy mechanism between social and economic values.

This paper takes the international eco-friendly express delivery industry as the research object, systematically analyzes the current situation and obstacles of realizing the social and economic value of recycled resources, and explores the influence mechanism of multi-dimensional factors such as policy, technology, market, and society on value realization. The research objectives include sorting out the development overview of the international eco-friendly express delivery industry and the current situation of recycled resource utilization, identifying the key obstacles to realizing the social and economic value of recycled resources, and proposing targeted policies and solutions to provide theoretical reference and practical guidance for promoting the sustainable development of the eco-friendly express delivery industry. Through this research, it is expected to provide empirical support for the practice of the concept of business for good in the environmental industry and promote the coordinated development of the social and economic value of enterprises.

2. Research methodology

This study adopts a systematic analytical approach to investigate the socio-economic value realization of recycled resources in the international green express delivery industry. The research integrates qualitative methods to ensure a comprehensive and in-depth exploration, structured as follows:

2.1. Literature review and case analysis

A thorough review of academic publications, industry reports, and policy documents was conducted to establish a foundational understanding of the global landscape. This was complemented by a comparative analysis of regional practices in the European Union, North America, and the Asia-Pacific region, highlighting divergent policy frameworks, technological adoption levels, and market dynamics.

2.2. Systematic analytical framework

Building on the initial review, a multi-dimensional framework was constructed to diagnose obstacles systematically. This framework organizes the analysis across four critical dimensions: (1) Policy and Regulation, (2) Technology and Innovation, (3) Market and Economy, and (4) Social Behavior, which forms the core of the barrier analysis in Chapter 3.

2.3. SWOT synthesis

Finally, the findings from the above analyses were synthesized using a SWOT (Strengths, Weaknesses, Opportunities, Threats) analysis. This method provides a strategic overview by integrating the internal and external factors affecting value realization, thereby bridging the diagnostic analysis with the subsequent formulation of strategies.

Together, these methods ensure a logically coherent progression from situational understanding to problem diagnosis and strategic resolution.

3. Current situation analysis

This section applies the literature review and case analysis methodology, as established in Chapter 2, to construct a comprehensive overview of the international green express delivery industry. The analysis is structured to first examine the macro-industry development across key regions, then investigate the micro-level practices in renewable resource utilization, and finally assess the current state of social and economic value realization. By systematically presenting this empirical evidence, the chapter sets the factual foundation necessary for the subsequent diagnostic analysis of the systemic barriers to value creation.

3.1. Overview of the development of the international express delivery and environmental protection industry

The European Union is at the forefront of global green logistics thanks to its strict environmental protection regulations. The EU's carbon emissions trading system (ETS) and the "carbon neutrality" goal have compelled enterprises to accelerate their transition to electric vehicles. Leading companies such as DHL have purchased large quantities of pure electric logistics vehicles from China's SAIC Maxus. These vehicles have a range of over 400 kilometers and can be charged to 80% in 30 minutes, meeting the core needs of urban deliveries. Packaging waste regulations require that 97% of courier packaging be recyclable, promoting the popularization of degradable materials. Goods with environmentally friendly packaging benefit from smoother customs clearance and higher market acceptance, and some enterprises have a clearance rate of 100% in Europe. Drone delivery has been piloted in Northern Europe, and the coverage of smart courier cabinets in Germany exceeds 62%. As global trade protectionism rises, green trade barriers adopted by developed countries—such

as the European Union's Carbon Border Adjustment Mechanism (CBAM)—have increased export costs for products like steel and cement, compelling enterprises to undergo costly green and low-carbon transformations.

The scale of the green economy in North America is expected to reach 1.8 trillion US dollars by 2025. Consumer research shows that 72% of North American consumers are willing to pay a 10% premium for green logistics. The carbon trading market is active, with the carbon price in California exceeding 30 US dollars per ton, and the market size of derivatives reaching 50 billion US dollars. In August 2022, the U.S. Congress passed the Inflation Reduction Act, which proposes to provide up to \$369 billion in subsidies over the next decade for investments in energy security and climate change. The act aims to develop onshore green industrial production, stimulate green consumption, and support and protect domestic manufacturing [6].

The Asia-Pacific region is a growth hotspot for global express delivery services. Particularly, the Southeast Asian market has a high annual growth rate. China holds the top position with a global market share of 45%, and the daily package volume exceeds 500 million pieces. According to the latest data from the National Development and Reform Commission, the global cold chain logistics market is projected to reach \$585.1 billion by 2026, with the Asia-Pacific region serving as the core engine driving this growth. Notably, in the global food supply chain sector, food losses due to insufficient efficiency of cold chain systems amount to as high as \$1 trillion annually, while also generating approximately 3.3×10^9 metric tons of additional CO₂ emissions [7].

3.2. The current situation of renewable resource utilization

Environmentally friendly packaging materials for express delivery mainly include degradable plastics, recycled pulp, and recycled packaging boxes. In 2020, the introduction of the plastic restriction order accelerated the process of converting express delivery packaging materials from non-degradable plastics to white card paper, and market demand for white card paper expanded rapidly [8]. There are mainly two types of biodegradable materials used for express packaging: First, biodegradable polymers, primarily PLA, PHA, and PBAT, are used for express packaging. These materials are mainly used to replace plastic packaging bags, plastic fillers, and plastic tapes. Among them, PLA is the most commonly used biodegradable plastic. Second, molded pulp is created by heat-pressing materials like bagasse and plant fibers to form packaging containers. It can be used not only to replace plastic fillers but also to secure products, taking the place of plastic supports.

Developed countries have generally established well-developed recycling networks. Germany implements the Green Dot recycling system, where enterprises obtain packaging usage licenses by paying fees, and the funds are used for the construction of the recycling system. Japan has established a network combining community recycling stations with professional recycling enterprises, with a recycling coverage rate of 95%. China mainly relies on end-point facilities such as Cainiao Stations for recycling, but due to the complexity of the waste items from courier packaging, the recycling difficulty is high, and the overall recycling rate of courier packaging waste in China is still below 20%, and the recycling system remains underdeveloped [9].

Automated sorting and intelligent packaging technologies are gradually being promoted. Thanks to the development and application of artificial intelligence, e-commerce logistics and warehousing facilities are continuously being upgraded and improved. Unmanned warehouses, automated sorting systems, intelligent packing, and delivery robots are being integrated into self-built logistics, gradually evolving into smart logistics warehouses [10].

3.3. The current situation of value realization

The need for social identity emphasizes the significance of social identity and values in consumers' participation in green behaviors. Through green express packaging promotion information via news media and online advertisements, as well as community and social atmosphere, it can effectively encourage consumers to adopt green behaviors, and the sense of identity and belonging gained from practicing green behaviors can motivate residents to participate more actively in community environmental protection activities [11]. The promotion of environmentally friendly express packaging has significantly reduced environmental pollution. Moreover, Environmental practices have enhanced the corporate image. However, a social value quantification assessment system has not yet been established.

The utilization of recycled resources has created new economic value. The annual output value of the German courier packaging recycling industry reaches 8 billion euros, providing 120,000 jobs. The scale of China's renewable resource recycling industry exceeds 1.5 trillion yuan, with courier packaging recycling accounting for approximately 5%. For instance, SF Express was the first in the courier industry to introduce laser paper boxes, which use laser engraving technology instead of ink printing. This can save 100% of ink consumption and has been promoted nationwide since 2020. It achieves environmental protection and green development while generating high economic value [12]. However, the current realization of economic value faces problems such as high costs and long return periods, which restrict the enthusiasm of enterprises to participate.

The promotion of green express packaging faces a significant gap between its theoretical ideals and practical implementation. Ideally, it should become a social consensus and corporate self-awareness, bringing about a win-win situation for the environment, the economy, and brand reputation. However, it is constrained by consumer behavioral inertia, corporate cost pressures, and insufficient coordination across the industrial chain. This gap between vision and action is precisely the core challenge facing the current green transition.

4. Systemic barriers to value realization

4.1. Multidimensional analysis

4.1.1. Analysis from the perspective of policies and regulations

The classification standards for recycled resources, the requirements for environmentally friendly packaging materials, and the rules for carbon emission accounting vary significantly among different countries. For instance, the EU's "Packaging and Packaging Waste Directive" stipulates that the proportion of recycled materials in courier packaging should be $\geq 60\%$ and the full life cycle carbon footprint should be indicated. Some countries in Southeast Asia only restrict non-degradable plastics and have not specified the requirements for the use of recycled materials. This regulatory fragmentation forces multinational enterprises to customize solutions for different markets, a practice that increases compliance costs and potentially leads to resource waste. For example, recycled cardboard boxes are compliant in the EU but are judged non-compliant in a certain country in Africa due to non-conformity with the standards.

Most countries' environmental protection policies for express delivery lack corresponding regulatory and punitive measures. Brazil's 2022 "Green Logistics Act" serves as a pertinent example. Although it requires a recycling material usage rate of $\geq 30\%$, due to insufficient regulatory manpower and backward detection technology, false declarations by enterprises are common. At the

same time, the regulatory responsibilities for cross-border express delivery are ambiguous. For instance, the quality supervision responsibility for recycled packaging of cross-border parcels between China and Germany is not defined by international conventions, creating a regulatory vacuum and hindering the cross-border realization of the value of recycled resources.

The current policies mainly consist of restrictive clauses and lack positive incentives. For instance, the United States imposes a carbon tax on environmentally friendly courier companies but does not offer tax relief or subsidies to those that use more than 50% recycled materials; in some Chinese cities, the green courier point system has limited appeal and low participation enthusiasm from enterprises. The lack of incentives leads enterprises to prefer low-cost traditional materials, and the economic value of recycled resources is difficult to be amplified through policies.

4.1.2. Analysis of the technical and innovative dimensions

There are technical bottlenecks in the recycling, sorting, and reprocessing of recycled resources. In the recycling process, the materials of international express packages are complex, and the accuracy of automated sorting equipment remains insufficient. A large amount of manual labor is required, and the recycling cost is high. In the reprocessing process, the melting and reshaping technology of recycled plastics cannot solve the problem of performance degradation. Its packaging compressive strength is lower than that of virgin plastics, and it does not meet the requirements of international express long-distance transportation.

The limitations in the properties of recycled materials restrict their value realization. In terms of physical properties, recycled paper packaging has insufficient water resistance and tear resistance. The damage rate of its international packages was higher than that of original paper packaging. In terms of appearance and customization, recycled plastic packaging is difficult to achieve complex printing and cannot meet the personalized needs of brands, resulting in low acceptance by enterprises.

Enterprises and research institutions have insufficient investment in the research and development of renewable resource technologies. The research and development focus of multinational express delivery companies is mainly on intelligent delivery and route optimization. The proportion of research and development on renewable materials is less than the others. Moreover, this type of technology has a long research and development cycle; patent conversion also proves difficult. There are inconsistent international recognition standards, and enterprises are concerned about the compatibility of the results, resulting in low investment willingness. For example, in 2021, Dutch Post invested in the research and development of degradable and renewable plastic packaging. Due to unstable high-temperature performance, it was only applied in some European countries, with a low investment-output ratio, which weakened the subsequent research and development enthusiasm.

4.1.3. Analysis from the perspective of market and economy

The high costs and low returns of recycled resources lead to an imbalance in the cost-effectiveness of enterprises. On the cost side, the production of recycled materials involves multiple processes, coupled with cross-border logistics and compliance costs, resulting in prices higher than those of raw materials. The unit prices of recycled cartons and plastic packaging are higher than those of raw materials. On the revenue side, recycled materials do not have a premium effect, and consumers' willingness to pay a premium is limited. E-commerce platforms also do not give preferential traffic

to businesses that use recycled packaging. It is difficult for environmental protection investments to be converted into economic benefits.

The investment in recycling resource equipment is characterized by high costs and long payback periods. The procurement and installation of an automated sorting line for cross-border express recycling resources require substantial capital, with a return on investment period significantly exceeding the conventional payback cycle of express delivery companies. Meanwhile, market demand remains uncertain, and shifts in policy or consumer preferences may introduce risks to early-stage investments. As a result, companies often lack confidence in long-term commitments and are more inclined to pursue short-term profitability, which hinders the large-scale adoption of recycling resources.

Furthermore, the market prices of recycling resources are highly volatile and influenced by multiple external factors. For instance, fluctuations in international energy prices, natural disasters, or geopolitical events can lead to instability in the supply of recycled materials or sharp price changes. Such price volatility not only disrupts corporate cost planning and operational strategies but also further diminishes companies' willingness to use recycled materials, thereby complicating the development of a green supply chain system.

4.1.4. Analysis of the social and behavioral dimensions

Consumer preference for sustainable packaging has become a significant trend. According to a 2023 survey by Trivium, 82% of global consumers are willing to pay a premium for eco-friendly packaging, with Gen Z showing a much higher willingness to pay (90%) than other age groups. A 2024 PwC survey further revealed that consumers are willing to pay approximately 9.7% more for sustainable products; meanwhile, a global study by Bain & Company indicated an average accepted premium of 12%. These data suggest that consumers broadly recognize the added value of eco-friendly packaging, yet a 30% premium clearly exceeds the psychological expectations of the majority.

Some companies exhibit a significant cognitive bias regarding the value of recycled resources, focusing excessively on short-term costs while neglecting long-term strategic value. For small and medium-sized cross-border express delivery enterprises, the recycling and utilization of recycled resources are often viewed as an additional burden. The substantial upfront investment, complex management, and extended payback period lead these companies, with limited resources, to prefer maintaining traditional operational models rather than undertaking the risks of transformation. The rational use of recycled resources not only yields environmental benefits but can also build long-term competitive advantages through technological innovation and brand differentiation. However, these values have not yet been fully recognized or prioritized in current corporate decision-making processes.

There is a significant gap in technology, facilities, and policies between developed and developing countries regarding recycled resources. It is difficult for them to collaborate. In terms of technology and facilities, the recycling systems in Germany and Japan are well-established. In contrast, the recycling systems in developing countries are not yet formed and rely on manual methods. In terms of policy awareness, consumers in developed countries have a strong environmental awareness. In developing countries, consumers are more concerned about prices. This gap makes it difficult for multinational enterprises to formulate a unified strategy. For example, recycled packaging sent from developed countries to developing countries may not be recyclable due to the imperfect local recycling systems, and the value may not be realized.

This multi-dimensional analysis reveals a complex array of fragmented challenges. To synthesize these factors and gain a holistic understanding of the strategic landscape, the following subsection employs a SWOT analysis to systematically integrate the internal and external barriers affecting value realization.

4.2. An integrated SWOT approach

To gain a more comprehensive and systematic understanding of the internal and external environment faced by the internationalized environmental protection express delivery industry in realizing the value of recycled resources, this section employs the SWOT analysis method to conduct an integrated assessment of the key factors that affect the realization of its social and economic values. By constructing a matrix of strengths, weaknesses, opportunities, and threats, the aim is to lay a strategic analysis foundation for subsequently proposing precise and effective countermeasures.

Table 1. SWOT analysis of value realization in the international green express delivery industry

Superiority	Weakness
S1: Massive market size and growth potential	
S2: Initial exploration of technological innovation and application	W1: Cost-benefit imbalance, poor economic feasibility
S3: Increasing environmental awareness and social acceptance	W2: Key technical bottlenecks have not been overcome
S4: Initial manifestation of economic value of recycled resources	W3: Low consumer participation and fixed behavioral habits
	W4: Corporate cognitive biases and lack of collaboration
Opportunity	Threat
O1: Global policy regulations becoming stricter and more guiding	T1: Inconsistent international standards and high compliance costs
O2: Rise of the green consumption market and willingness to pay	T2: Increasing global development imbalance
O3: Increased support from finance and capital markets	T3: Fluctuations in raw material prices and competition
O4: Empowerment by digital and intelligent technologies	T4: Geopolitics and economic global uncertainty

As shown in Table 1, the path of realizing the value of recycled resources in the international environmental protection express delivery industry is characterized by both opportunities and challenges. Although there are significant disadvantages such as costs, technology, and participation levels within the industry, it also possesses core advantages such as market size, innovation potential, and social recognition. The tightening of policies, the rise of the market, and technological empowerment are major opportunities, while inconsistent standards, unbalanced development, and price fluctuations are severe threats. Therefore, subsequent strategy formulation must be based on the actual internal situation, adapt to the circumstances, adopt a combined strategy, and maximize the utilization of opportunities and advantages, while minimizing the impact of threats and disadvantages.

5. Strategy

5.1. In terms of policies

Establish a coordinated mechanism for international courier packaging environmental standards, led by the United Nations Environment Programme. Develop unified environmental standards for

packaging materials and recycling targets. Each country should formulate specific implementation rules based on this, but the core indicators must remain consistent to reduce the compliance costs for multinational enterprises. At the same time, promote policy mutual recognition. For example, the EU has implemented the green pass system, and environmentally friendly packaging that meets the standards can be freely circulated among member states. China can refer to the experience of Germany's Green Dot system and establish a producer responsibility extension system, requiring enterprises to pay back fees based on the amount of packaging used. These fees are specifically used for the construction of the recycling system.

Each country needs to strengthen the supervision of courier packaging environmental protection, increase the number of law enforcement officers, and increase inspection frequencies. At the same time, increase the severity of penalties, linking the fine amount to the enterprise's annual turnover, such as setting it at 1%-5% of the annual turnover. Enhance the deterrent effect of supervision. In terms of incentive measures, implement differentiated tax policies. Provide VAT exemptions for enterprises that use environmentally friendly packaging. For example, China can reduce the VAT rate for environmentally friendly packaging materials from 13% to 6%. In addition, establish a special fund to support the research and development of environmentally friendly packaging and the construction of recycling facilities. Like the Horizon Europe program of the EU, 1 billion euros are invested annually to support green packaging innovation.

5.2. Technical aspect

Increase investment in the research and development of environmentally friendly packaging technologies, establish a national key research and development program, and concentrate efforts on solving key technologies such as separation of composite materials and improvement of recycled material performance. Promote collaborative innovation among industry, academia, and research institutions, and form an innovation consortium consisting of leading enterprises, universities, and research institutions to share research resources and results. For example, China can establish a "Green Packaging Innovation Alliance" jointly with enterprises like JD and Cainiao, as well as universities like Tsinghua University, to jointly develop high-performance recycled materials. At the same time, strengthen international technological cooperation and introduce advanced technologies from developed countries, such as intelligent sorting equipment from Germany and biodegradable technology from Japan.

Widely apply Internet of Things, big data, and artificial intelligence technologies in the courier industry to improve packaging recycling efficiency. Promote intelligent packaging systems, which can automatically select the most suitable packaging specifications based on the size of the goods, reducing material waste. Apply blockchain technology to build a packaging full life cycle traceability system to improve the recycling rate. Take DHL's intelligent green packaging project as an example, using RFID tags to track the packaging, flow and increasing the recycling rate by 30%. In addition, develop lightweight and high-strength new environmentally friendly materials, such as nanocellulose-based packaging materials, which are 50% stronger than ordinary cardboard and 30% lighter in weight.

5.3. Market level

Financial institutions have developed specialized financial products for the environmental protection projects of express delivery, such as green bonds and environmental protection loans, offering preferential interest rates and long-term financial support. They have also established an express

delivery environmental protection industry investment fund to attract social capital to participate in the construction of the recycling system. For example, China can set up a 10-billion-yuan green express development fund to support the research and development of environmentally friendly packaging and the construction of recycling facilities. At the same time, they have developed price insurance products for recycled resources to help enterprises manage risks caused by price fluctuations. Additionally, they have promoted green supply chain finance to provide financing convenience for upstream and downstream enterprises using environmentally friendly packaging, creating a synergy effect within the industry.

A unified platform for recycled resources is established to enhance transaction efficiency and transparency. The "Internet and recycling" model is implemented, such as the "Aid Recycling" platform in China, which improves the convenience of recycling through online reservation and offline collection. At the same time, a certification system for recycled materials is established to issue certification marks for those meeting the standards, increasing their market recognition. Moreover, a cluster of recycled resource utilization industries is cultivated to achieve scale effects, such as the Green Packaging Industrial Park in Hamburg, Germany, which gathers over 50 related enterprises and has an annual output value of over 2 billion euros.

5.4. In terms of international cooperation

International organizations such as ISO (International Organization for Standardization) and WTO (World Trade Organization) have led the formulation of global unified environmental protection standards for courier packaging. Countries have gradually adopted these standards. An international certification mutual recognition mechanism has been established; for example, the EU's EU Ecolabel and the US's Green Seal are mutually recognized, reducing the cost of repeated certifications. At the same time, it helps developing countries enhance their capabilities in this regard, through technical assistance and personnel training, to help these countries improve their ability to implement environmental protection standards. For instance, the United Nations Environment Programme can launch a global courier environmental protection initiative, promoting standard coordination and capacity building.

Multinational courier enterprises cooperate to build a global green logistics network, sharing environmentally friendly packaging and recycling facilities. For example, DHL, FedEx, and UPS can jointly develop recyclable international courier packaging and establish recycling centers in major hub cities. At the same time, they promote the construction of green logistics along the "Belt and Road Initiative," planning environmentally friendly packaging production bases and recycling networks in countries along the route. In addition, an international courier environmental protection data sharing platform is established to monitor the use and recycling of packaging in various countries in real time, providing a basis for policy formulation. For example, the World Bank can lead the establishment of a global courier environmental protection database to promote information transparency and the sharing of experience and knowledge.

6. Conclusion

This paper systematically investigates the issue of realizing the social and economic values of recycled resources in the international environmental protection express delivery industry. The study reveals that the current industry is confronted with multiple obstacles, such as inconsistent policy standards, technical bottlenecks, cost imbalance, and insufficient consumer participation, which prevent the full realization of the value of recycled resources. By constructing a multi-dimensional

analytical framework, this paper proposes systematic solutions, including policy coordination, technological innovation, market mechanism optimization, and international cooperation. The research results indicate that only when the government, enterprises, consumers, and international organizations collaborate in a multi-party manner can the sustainable development of the environmental protection express delivery industry be effectively promoted, achieving a win-win situation of social and economic values. This study provides theoretical support and practical guidance for the practice of the business-for-good concept in the environmental industry and is of great significance for promoting the green transformation of the global express delivery industry.

This study, while providing a systematic analysis, is primarily based on literature and case studies. Future research could benefit from quantitative methods, such as surveys to validate consumer behavior or econometric models to assess the economic impact of proposed policies, thereby offering more empirical evidence.

References

- [1] Sun Jingwen & Hang Zheng. (2018). Problems and Countermeasures of Environmental Packaging for Express Delivery. *Market Weekly (Theoretical Research)*, (03), 23-24, 30.
- [2] Dai Tian. (2010). SWOT Analysis and Development Strategy of the Recycled Resources Industry in Zhiluo City. *Management World*, (04), 179-180.
- [3] C. A. Stübner, J. Roebers & M. Schönhardt. (2025). Lebensmittelsichere Geschenkbänder–Von der regulatorischen Bewertung zur Produktionsanpassung. *Lebensmittelchemie*, 79 (S3), S3-165-S3-165.
- [4] Susan Opp. (2011). Bureaucratic Discretion and Political Control of the Resource Conservation and Recovery Act (RCRA). *International Journal of Public Administration*, 34 (12), 753-763.
- [5] Takehiro Usui. (2007). Estimating the effect of unit-based pricing in the presence of sample selection bias under Japanese Recycling Law. *Ecological Economics*, 66 (2), 282-288.
- [6] Zhang, Z. (2024). Can the world build trust and consensus on climate change? — On the importance and prospects of China–U.S.–EU climate cooperation. *People's Tribune Academic Frontier*, (08), 31–48.
- [7] Akram, H. W., Akhtar, S., Ahmad, A., et al. (2023). Developing a conceptual framework model for effective perishable food cold-supply-chain management based on a structured literature review. *Sustainability*, 15(6), 4907.
- [8] Wang Wanyi. (2023). Research on the Performance of Green Transformation of Papermaking Enterprises under the Background of High-Quality Development (Master's Degree Thesis, Jinan University). Master's Degree.
- [9] Yang Xueli. (2025). A Brief Analysis of Legal Protection for the Recycling and Utilization of Express Packaging Waste in China. *China Packaging*, 45 (08), 33-37.
- [10] Ran, D. Q. (2020). A Study on Logistics Cost Control in E-commerce Enterprises (Master's thesis, Huaqiao University). Master.
- [11] Chen Shuyi. (2025). Research on Incentive Policies and Measures for Green Low-Carbon Behaviors in Express Packaging. *Green Packaging*, (01), 69-73.
- [12] Song Weiwu. (2023). Research on the Impact Path of ESG Performance on Enterprise Value (Master's Degree Thesis, Southwest University of Finance and Economics). Master's Degree.