



# FINANCING GREEN LOGISTICS AND GREEN TECHNOLOGIES

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## Abstract

This article discusses the issues of green logistics that are moving to the implementation of projects to modernize the transport fleet, for example, using the experience of introducing energy-efficient engines. To reduce harmful emissions to the environment and introduce environmentally friendly technologies for the effective application of economic methods to a sustainable future.

**Keywords:** Green logistics; financial resources; financial organizations; investments; digitalization of logistics processes.

## Introduction

Green logistics is a comprehensive measure to minimize the objective environmental factors of supply chains, including the reduction of emissions, packaging waste and noise. Green logistics optimizes existing routes, uses environmentally friendly transport and rationally distributes resources. This reduces the level of air and soil pollution, improves the environment and increases the competitiveness of business. measures such as the optimization of



transportation, i.e. the use of algorithms to reduce mileage, the introduction of electric and hybrid vehicles; reusable packaging, this is a transition to recyclable materials and a reduction in their volume; reverse logistics, which organizes the return, recycling or disposal of used products and containers; ecological warehouses, i.e. the use of energy-efficient technologies in warehouses; to revise the parameters of environmental impact - this is the reduction of greenhouse gas emissions ( $CO_2$ ,  $NO_x$ ,  $CH_4$ ); environmental friendliness of logistics processes is aimed at minimizing the pollution of soil, water and air with harmful waste; Resource conservation is one of the main factors in the rational use of natural resources and the preservation of flora and fauna.

The introduction of green logistics contributes to the long-term financial sustainability of organizations and strengthens their budget. Financing of "green" logistics in Uzbekistan is attracted through international grants, "green" bonds and loans from MFIS (WB, EBRD, ADB). Implementation takes place through the modernization of transport (electric vehicles, gas fuel), the development of infrastructure in the FEZ and the introduction of energy-efficient technologies. International financial institutions (IFIs) are involved in integrated development, such as the World Bank (WB), the International Monetary Fund (IMF) and the Asian Development Bank (ADB), which proactively support economic reforms and environmental innovations. As part of the development of special economic zones (SEZs), technology parks and clusters, investments are attracted to create environmentally friendly logistics centers. The implementation of projects to modernize the transport fleet, for example, using the experience of introducing energy-efficient motors, is being considered. The transition of enterprises to environmentally friendly logistics gives an advantage in the scale of the entire production, increasing profitability and good corporate citizenship. But the main driver is the need of the customer. As customers (both companies and consumers) see the real results of climate change on a daily basis in news channels and streaming channels, they are rapidly changing loyalty to companies that demonstrate significant, ongoing steps toward a sustainable future.

## Materials and Methods

To attract financial resources to green logistics in Uzbekistan, methods of system analysis, modeling, multi-criteria assessment (MCDA) and life cycle analysis



(LCA) are used. To determine the main methods for studying and researching the attraction of financial resources for the development of green logistics in Uzbekistan, an integrated approach is required, combining general scientific methods, specialized logistics analysis and assessment tools financial mechanisms. The assessment of the effectiveness of attracted investments is measured through indicators of profit, unproductive costs and reduction of environmental impact. Traditionally, supply chains have been linear and unidirectional: raw materials were processed into products, sent to customers, and then disposed of. Today, this flow is deteriorating due to two practices: reverse logistics and closed supply chains, which increase the efficiency of supply chains and reduce their environmental impact. Reverse logistics refers to the processes of returning goods and products that move in the opposite direction through the supply chain. This may include repairs and maintenance, the return of defective goods, the reuse of packaging, or the recycling and disposal of end-of-life products. For businesses, today's reverse logistics problems most often arise in the form of customer returns. Online shopping contributes to a much higher rate of customer returns than in-store purchases. This problem is exacerbated by the business model of brands offering "box subscriptions" (usually fashion brands), which is entirely based on the concept that customers choose from a wide range of deliverables and return the ones that don't suit them.

A closed supply chain is a chain in which organizations recycle their resources as much as possible – from raw materials to finished products. In its simplest form, this means extracting value from end-of-life products, often by recycling their main components. For example, plastics can be shredded and repurposed – even into the most shipped pallets that are used to move goods. And as the global supply of the metal decreases, there is a significant value to have in the mining of gold, copper, and other recyclable goods.

## Results

The introduction of methods for attracting financial resources (green bonds, loans, international grants) for the development of "green" logistics in Uzbekistan is aimed at decarbonizing transport, reducing harmful emissions and introducing environmentally friendly technologies. introducing green standards, stimulating investment in environmentally responsible areas. Funds from international



financial institutions are actively used to implement projects aimed at reducing emissions. Green logistics models similar to those used by world leaders (IKEA, Alibaba, Tesla) have been studied and proposed for implementation. The main attention is paid to improving energy efficiency and digitalization of logistics processes, including through the use of artificial intelligence. These projects aim to reduce air pollution and improve environmental quality. At the peak of the COVID pandemic, online shopping grew to record levels, with shipments in the US alone increasing by 37 percent from 2019 to 2020, reaching 55 million deliveries per day. The "Amazon effect" creates an additional burden on logistics, as consumers wait for delivery throughout the day, sometimes for several hours. This means that goods can no longer be collected in one place and distributed on a national scale. To achieve this high speed of delivery, goods must be stored in local distribution centers and shipped to consumers in small batches. This will require more smaller vehicles. According to the World Economic Forum, we should expect demand for urban last-mile delivery to grow by 78% by 2030, and add 36% more delivery vehicles in the world's top 100 cities.

To meet changing delivery requirements, companies are rapidly shifting to electric vehicle fleets. The cost of electricity per kilometre is less than half that of both petrol and diesel, and there is no need for oil changes, all of which provide electric fleets with lower operating costs and less downtime. Another advantage of electric vehicles for businesses is their easy integration into the cloud supply chain. This means that companies can use AI-powered technology to analyze operational data, both historical and real-time, to efficiently (and practically) find ways to save money, reduce fuel consumption, and optimize operations overall. Modern computers also vary in power and size. Today, we are witnessing an increase in the range of not only light commercial vehicles (LCVs) such as trucks, but also electric semi-trucks and long-haul vehicles. And when it comes to environmentally friendly transport, let's not forget that approximately 80-90 percent of the world's cargo is transported by sea. Container ships emit about 1 billion metric tons of carbon dioxide into the atmosphere each year (about 3% of all greenhouse gas emissions) and dump tons of toxic waste into the oceans. Recognizing this, the International Maritime Organization (IMO), made up of 150 industry leaders, set a decarbonization goal in September 2021: to reduce emissions by 50% by 2050 compared to 2008 levels. Danish company Maersk



(whose ships emitted 33 million tonnes of CO<sub>2</sub> in 2020) has ordered eight new ships that run on carbon-neutral methanol to help achieve this ambitious goal. Japanese and Norwegian shipping companies are also making significant innovations in cargo transportation, developing all-electric tankers and even the world's first autonomous electric cargo ship (using radar, infrared sensors, and built-in analytical cameras) that is capable of operating and moving in a fully automatic mode using remote control.

To maximize cost efficiency, speed up delivery, and significantly reduce emissions and waste, businesses need to consider more efficient logistics methods of collaboration and more sophisticated optimization tools. Cargo concentration: The growing trend of optimizing logistics supply chain management is encouraging similar (even competing) businesses to conserve and jointly combine logistics resources. At first glance, it may seem like a complicated concept, but fortunately, cloud-based logistics management technologies help businesses collaborate with the highest transparency and control.

Non-company parcel lockers: This is Amazon's first idea, which is to install parcel lockers in nearby areas to shorten routes and improve delivery speeds. This method is very effective, but it usually involves handling the volume of cargo belonging to competitors, among others. Non-company public packet wardrobes work in a similar way to Amazon's existing clothing exchange chains, but are available to a much wider range of suppliers. By making these resources more accessible, large logistics providers can collaborate with each other, saving time and money, as well as increasing consumer choice.

Automatic load optimization means coordinating items (located in warehouses and distribution centers) with similar RCCBs and addresses. With today's volumes, this is almost impossible to do manually, but intelligent supply chain solutions allow you to identify and automate vehicle loading to eliminate the costly application of sending semi-loaded wagons.

Overnight delivery: The more time vehicles spend on the road, the more fuel and energy are consumed. Overnight delivery, especially in urban areas, can reduce traffic jams and congestion times by 15%. In addition, due to less noise from EVs, the risk of connecting to nighttime noise pollution is low.

Micromobility refers to small, usually two-wheeled vehicles, such as electric scooters and e-bikes. Modern logistics technology now allows drivers to easily



access cloud-based applications. This means real-time communication with the home database (delivery) and the customer (email delivery). By using a network of independent drivers on demand (not just for any business), companies save significantly on both fuel costs and the cost of maintaining a permanent fleet.

**Dynamic route allocation:** In urban environments, cloud-based route allocation tools can estimate traffic volume, parking spaces, and even construction sites or other delay factors. In rural areas, other factors may be more important, such as road and weather conditions or the distance to EV charging stations. By incorporating this real-time information into route planning, companies can increase delivery speeds and reduce fuel consumption.

**Drones and automated vehicles:** It's visually appealing to think of drones crossing the sky and dropping packages, such as mechanized storks, or unmanned robots rolling down city sidewalks loaded with packages. However, in reality, we are still a few years away from fully automated logistics networks. But innovation in the sector is fast, and digital automation is at the forefront of many green solutions, so watch this space.

## **Discussion**

The benefits of green logistics come to the company, its suppliers and partners, its customers, every member of the community. In the long run, increased profitability has led to it increasing from the first to the last mile, while green logistics has reduced emissions, costs and carbon dioxide emissions. Although the realization of profits from green logistics requires upfront investment, the profits when reduced exceed the costs. Recent research, "Companies with a high level of sustainability in the long term significantly outperform their peers in both the stock market and the efficiency of calculations." Total profit? Eco-friendly business is good business.

**New or expanded partnerships.** If companies use sustainable supply chains and environmentally friendly logistics, it becomes more attractive not only for consumers, but also for the company's partners. A recent HBR study found that large multinational companies use the United Nations Global Convention or the Supply Chain Development Program (CDP) to assess the sustainability of suppliers and their environmental impact. Suppliers, in turn, are looking to



establish partnerships with the largest brands and invest in reducing their carbon footprint.

Whether it's retail or corporate, happy and loyal customers require flexibility that allows for fast delivery and easy returns. Customers want to know where their products come from, whether they are sustainably sourced, whether they are transported in an environmentally friendly way, and where their orders are in real-time. Companies that offer this information and transparency attract new customers and build long-term loyalty to existing customers.

Raising the profile of corporate responsibility More and more large corporations are being held accountable for their contribution to global warming, which is considered a social justice issue. Using the benefits of green logistics by public opinion will help companies win positive public opinion. Smart companies are scrutinizing their environmental impact, both locally and globally. Those who do not want to change risk their reputation and continue to be competitive, especially when switching to fossil fuels.

Attracting employees in a tough labor market has been one of the company's important advantages for decades. An organization focused on green logistics is even more attractive to young professionals who want to work in a company that implements their own ideas.

## **Conclusion**

The development of green logistics in Uzbekistan requires diversification of financing channels, including green bonds, government subsidies and environmental loans. This study, based on data analysis, systematization and modelling techniques, aims to assess the effectiveness of investments in sustainable supply chains green financing.

The need for digitalization (blockchain, IoT) and the integration of environmental aspects into transport policy. To effectively attract resources, it is necessary to support public-private partnerships (PPPs), develop a regulatory framework for green bonds, and train specialists. Powerful cloud-based logistics solutions powered by artificial intelligence (AI) form the backbone of the future supply chain, supporting businesses in tasks such as cargo consolidation, routing and monitoring automation, route optimization, determining when and where to charge a battery, calculating estimated time of arrival (ETA), and monitoring



vehicle maintenance. Modeling and data modeling allow you to test the routes and capacities of the fleet of vehicles, and integrated technologies allow you to integrate and analyze the supply chain and supply data along the entire value chain. Every step towards smoother and faster movement and delivery of goods is a win that makes customers happier and more engaged, and helps companies improve both their sustainability profiles and bottom lines.

## References

1. Almava S.G. Innovations in Entrepreneurial Activity. Monography. T.: Tib nashr Publishing House. 2025. 120 p.
2. Alimova S.G. " Зелёная экономика с точки зрения биоэтики" Ethics and Integration Issues in Medical Education. TTA Conference Proceedings. Vol. 2, 2021. 90-93 page.
3. Alimova S.G. Digital Transformation in the Field of Health Preservation — This Minimization and Reduction of Costs in the Future. JOURNAL OF ADVANCED RESEARCH AND STABILITY (JARS). 2021
4. Attracting investments and strengthening their impact while building innovative potential in education./ Alimova S.G. et al. Western European Journal of Linguistics and Education Volume 3, Issue 10, October 2025 <https://westerneuropeanstudies.com/index.php/2> ISSN (E): 2942-190X pp.11-15
5. The problems of environment and green economy./ Alimova S.G. i dr. Western European Journal of Linguistics and Education Volume 3, Issue 4, April 2025 <https://westerneuropeanstudies.com/index.php/2> ISSN (E): 2942-190X pp.46-49
6. The role of information and communication technologies in the health care system and ways to improve the efficiency of management./ Alimova S.G. i dr. /"Innovations in Science and Technology" Science-Electron Journal ISSN: 3030-3451. 2 / 2025 йил. [www.innoist.uz](http://www.innoist.uz). DOI: 10.5281/zenodo.15318939 Link: <https://zenodo.org/records/15318939> pp. 200-205.
7. The role of information and communication technologies in the healthcare system and ways to improve management efficiency/ Alimova S.G. i dr. /



International Scientific-Electronic Journal “Pioneering Studies and Theories”

ISSN: 3060-5105. Volume 1. Issue 4. 2025. pp.105-109

8. Alimova S.G. etc. Digital Economy: Requirements for the Development of the Technical Digital Environment. Philosophic Readings. XIII.4 (2021) 3152-3156 p.