

ATTITUDES OF POLISH CONSUMERS TOWARD SUSTAINABLE LOGISTICS – PILOT STUDIES

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Purpose: The main objective of this article is to identify and analyze the attitudes of Polish consumers toward practices related to sustainable logistics.

Design/methodology/approach: The results will be based on empirical research concerning attitudes toward practices related to sustainable logistics in a research sample of 130 consumers. The research was conducted in November 2023 and covered the entire area of Poland.

Findings: The vast majority of respondents are positive when assessing their ecological attitude. Therefore, they have specific preferences in the field of urban transportation. Most often they use electric bicycles or scooters. In addition, they prefer goods to be delivered to parcel machines. They appreciate when shipments are combined into one delivery or the switching of paper transport documents into electronic ones. Priority solutions in sustainable logistics include, in the opinions of consumers, organizing intelligent and ecological warehouses and modernizing the transport fleet. In addition, almost half of the respondents assessed that they are aware of greenwashing in the logistics industry and in their opinion the phenomenon is mainly manifested by the abuse of not insignificant formations in the field of sustainable development.

Research limitations/implications: Among the limitations of the research are the small sample size of the empirical study, as well as the limited nature of the survey questionnaire.

Practical implications: This research has provided a lot of practical information that can be used in the business environment. Firstly, companies knowing consumer preferences can better adjust their marketing strategies to meet expectations, as well as develop more attractive product offerings. In addition, the research points to the need for public campaigns to educate consumers about sustainable logistics, as well as greenwashing.

Social implications: This research can be a systemic shift toward more environmentally and socially responsible practices in both the private and public sectors. By influencing public attitudes, corporate behavior, policy development, and quality of life, it can contribute to building a more sustainable and resilient society for future generations.

Originality/value: Up-to-date knowledge of consumer attitudes toward sustainable logistics activities is particularly important for both the business and government communities.

Keywords: sustainability, consumer attitudes, greenwashing.

Category of paper: Research paper.

1. Introduction

Sustainable development is a concept involving a harmonious balance between social, economic development and environmental protection. It involves ensuring that current and future generations can fulfill their needs and aspirations without destroying the environment or limiting the ability of future generations to use it. It should be noted that the realization of the goals of sustainable development requires the cooperation of all market participants, including government agencies, the private sector, NGOs, civil society and scientific research institutions. It is worth noting that the concept of sustainable development has special relevance to logistics, which plays a key role in ensuring sustainable development on many levels. Sustainable logistics aims to reduce the carbon footprint, waste and pollution at all stages of the supply chain from production, storage, transportation to the distribution of products to final customers (Jayarathna, Agdas, Dawes, 2023).

Sustainable logistics is a topic that is frequently discussed in contemporary literature on the subject (e.g., Ren et al., 2020; Zowada, 2020). Also, consumer attitudes toward various new technologies, products or practices of companies in the market are an important and repeatedly addressed topic in scientific research (e.g., Gárdan et al., 2023; Reddy et al., 2023). However, there is a lack of research related to Polish consumers' overall perception of sustainable logistics. Previous work has been related to Poles' attitudes toward environmental issues (e.g., Wachowiak, 2022; SW Research, 2023) and their awareness of these issues (e.g. Moroz et al., 2021; Stefaniuk, 2021). Much research has also been devoted to topics related to urban sustainability and consumer attitudes toward selected forms of low-carbon urban transportation. Special attention has been paid to e-bicycles, e-scooters and electric cars (e.g. Fyhri, Sundfør, 2020; Tupe, Kishore, Johnvieira, 2020; Sendek-Matysiak, 2020; Wu, Liao, Wang, 2020; Kopplin, Brand, Reichenberger, 2021; Popova, Zagulova, 2022). There is also a great deal of interest in studies related to consumer attitudes toward environmentally friendly delivery of the products they purchase (e.g. Ingat, Chankov, 2020; Caspersen, Navrud, 2021; Mobile Institute, 2021) and the most frequently chosen form of delivery (Lemantowicz, Sitarska, 2022; Geminus, 2022). In connection with the rapid development of technologies enabling more environmentally friendly packaging of goods, answers are being sought to questions related to consumer attitudes toward different types of packaging (Nguyen et al., 2020; Mobile Institute, 2021). No less attention has also been paid to the phenomenon of greenwashing, where the main focus has been on discussing the phenomenon and ways to reduce it (e.g. de Freitas Netto et al., 2020; Pimonenko et al., 2020).

In view of the above, the topic of Polish consumers' attitudes toward sustainable logistics is important, topical and involves both academic researchers from various fields of science and practitioners.

The main objective of this paper is to analyze the attitudes of Polish consumers toward sustainable logistics. The specific objectives are to learn about Polish consumers' preferences toward various forms of sustainable urban transportation and environmentally friendly forms of delivery, to identify the most important pro-environmental activities of companies related to the shipment of goods, as well as the priority sustainable logistics solutions in the opinion of the respondents. In addition, an important goal of the survey is also to learn about respondents' awareness of green goods delivery and greenwashing.

2. Research methodology

The main objective of the study was to determine the attitudes of Polish consumers toward sustainable logistics. The method used in the research process was a diagnostic survey using a questionnaire technique. The survey used the technique of CAWI (Computer Assisted Web Interview) – a computer-assisted interview through survio.pl. For the purposes of the pilot study, a survey questionnaire was developed, consisting of a main part containing eight questions and a metric to characterize respondents (Table 1).

Table 1.
Characteristics of the research sample

Variable	Characteristics
Gender	Women – 62.3%, men – 36.2%, non-binary – 1.5%
Age	18-24 years – 31.5%, 25-34 years – 20.8%, 35-44 years – 25.4%, 45-54 years – 15.4 %, 60-64 years – 3.8%, >65 years – 3.1%
Residence	City – 63.8%, rural – 36.2%
Education	Higher – 59.2%, secondary – 36.2%, vocational – 4.6%
Assessment of income situation	Very good – 16.9%, good – 45.4%, average – 33.8%, bad – 2.3%, very bad – 1.5%

Source: Own elaboration.

3. Results and discussion

Respondents were asked to rate their own environmental attitude (Figure 1). The vast majority declared that they rated it rather well (66.2%), almost one-fifth rated it definitely well and only 6.2% rated it rather badly or definitely badly. This is also confirmed by a study conducted by SW Research (2023) on Poles' attitudes toward ecological issues, according to which the percentage of eco enthusiasts is growing year by year, indicating that ecology is

becoming increasingly important in the public discourse. Also, a survey of students at Podlasie Universities found that despite not having extensive environmental knowledge, they are characterized by high environmental awareness (Moroz et al., 2021). Moreover, environmental protection is increasingly perceived by consumers as one of the most important problems facing Poland (Stefaniuk, 2021).

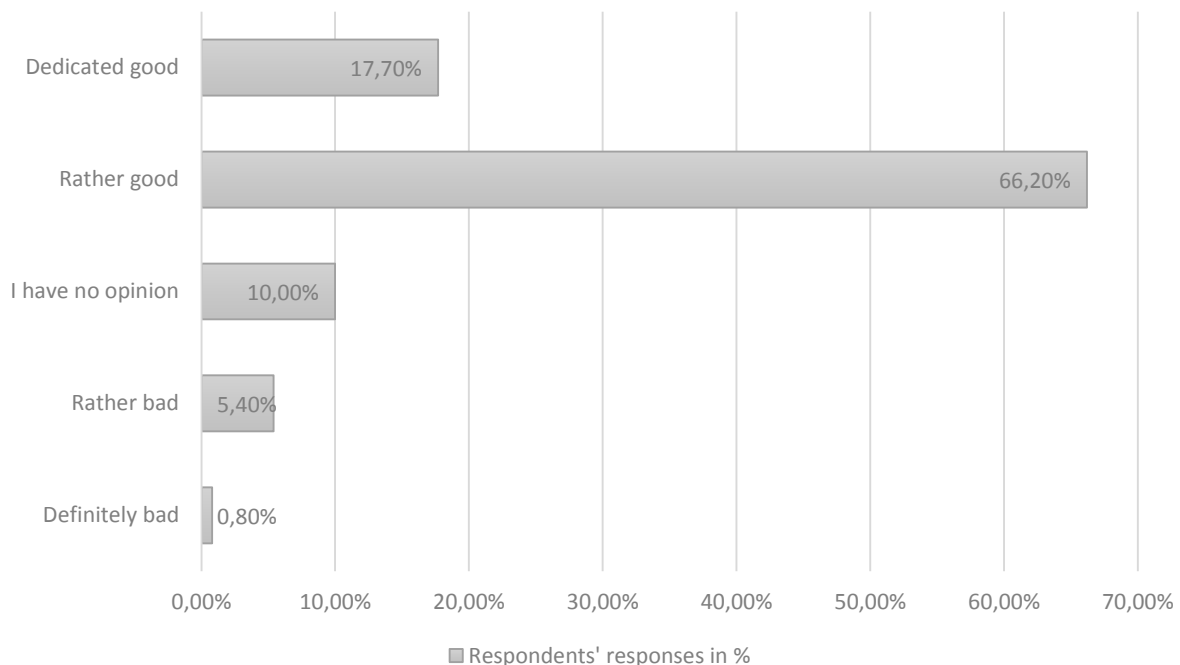


Figure 1. Respondents' assessment of their own environmental attitudes.

Source: Own elaboration based on the conducted surveys.

A special role in the pursuit of sustainable development has been attributed to cities for years (Popova, Zagulova, 2022), so one of the important manifestations of consumers' green attitudes is their decisions related to the form of urban transportation.

In this study, respondents were asked to indicate their preferences in this regard (Table 2). It was revealed that more than one-quarter of the respondents opt for their own electric bicycle or other means of transportation other than those indicated in the survey. Public electric bicycles are used by 21.5%. Sharing a private car with others going in the same direction is preferred by 19.2%. Nearly 18% of respondents choose a publicly available electric scooter to travel around the city, while just over 13% use their own. Their own electric car is used by 14.6% of respondents, and their own electric scooter by 8.5%. The lowest percentage of respondents use an electric car for minutes (3.8%). The above results are reflected in the opinions of students at the Warsaw University of Life Sciences, who, among the ways to sustainably manage household resources, mentioned changing modes of transportation to greener ones (Wachowiak, 2022). Also, research by Fyhri and Sundfør (2020) confirms that electric bicycles are becoming an increasingly important part of the urban transportation system and can be an important contribution to reducing the negative environmental impact of urban

transportation. In turn, the high popularity of electric scooters among consumers is confirmed by studies conducted by Kopplin, Brand and Reichenberger (2021) or Popova and Zagulova (2022). It is worth noting, however, that Germans, for example, perceive electric scooters as a source of entertainment rather than a meaningful way to get around town and are seen as less safe than other modes of transportation (Kopplin, Brand, Reichenberger, 2021). As evidenced by studies by Tupe, Kishore, Johnvieira (2020), Wu, Liao and Wang (2020) and Sendek-Matysiak (2020), among others, an important obstacle influencing the less frequent choice of electric cars for urban travel is the country's poor infrastructure and the price of these vehicles, which may confirm the low consumer interest in this mode of urban travel in this study.

Table 2.
Preferences for green forms of urban transportation

Forms of urban transportation	Responses	Share %
Electric car for minutes (carsharing)	5	3.8%
Own electric car	19	14.6%
Sharing a private car with others going in the same direction (carpooling)	25	19.2%
Publicly available electric scooter	23	17.7%
All-access electric bicycle	28	21.5%
Own electric scooter	18	13.8%
Own electric bicycle	34	26.2%
Own electric motor scooter	11	8.5%
Other forms of urban transportation	34	26.2%

Source: Own elaboration based on the conducted surveys.

Figure 2 shows the respondents' environmental awareness in the context of product delivery. To the question "do you pay attention to the pro-environmental aspects of the delivery of the products you buy?" as many as 64% said "yes". Only 25% said they do not take this aspect into account when shopping, and 11% have no opinion. These results are in line with a number of surveys conducted in various countries, where consumers also declare their pro-environmental attitude toward delivery (e.g. Ingat, Chankov, 2020; Caspersen, Navrud, 2021). It is worth noting that consumers declare the possibility of waiting longer for a shipment when the supplier sends all purchased products in one package in order to reduce the carbon footprint (Mobile Institute, 2021).

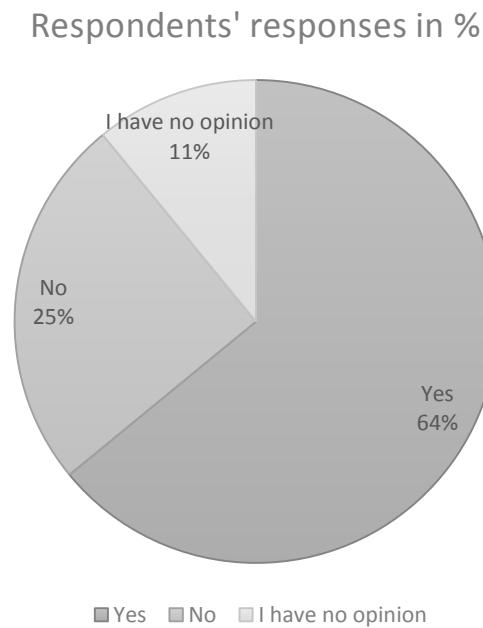


Figure 2. Environmental awareness in the context of product delivery.

Source: Own compilation based on the conducted surveys.

Respondents consider parcel machine delivery to be the most eco-friendly form of delivery (63.8% of responses). It is worth noting that parcel machine delivery is the most frequently chosen form of delivery among Poles (Lemantowicz, Sitarska, 2022; Geminus, 2022). Nearly one-quarter perceive personal pick-up at a store branch and delivery by a courier using an electric or hybrid car (23.1%) as the most environmentally friendly deliveries. Many respondents also pointed to the delivery of products by a courier using an electric bicycle (18.5%) or delivery to pick-up points (13.8%). The least environmentally friendly, in the opinion of consumers, are deliveries by a courier directly to home or work (8.5%) and traditional deliveries by the post office (0.8%). Detailed results are presented in Table 3.

Table 3.

Respondents' opinions on environmentally friendly forms of delivery

Forms of delivery	Responses	Share %
Delivery to parcel machines	83	63.8%
Delivery by courier to pick-up points (e.g., Żabka, Polish Post Office, gas station)	18	13.8%
Delivery by courier directly to home/work	11	8.5%
Traditional delivery by post office	1	0.8%
Personal pick-up at a branch of the store	31	23.8%
Delivery by courier using an electric bicycle	24	18.5%
Delivery by courier using an electric or hybrid car	30	23.1%
Other	2	1.5%

Source: Own elaboration based on the conducted surveys.

Companies take many measures to reduce their negative impact on the environment. Respondents were asked to rate the importance of selected pro-environmental aspects of companies' supplies and activities (see evaluation in Table 4). It can be seen that respondents gave the highest ratings to activities related to combining shipments in a single delivery

(on a scale of 1 to 5 ,where 1 means - not important in general, and 5 - very important, 87.7% of respondents assigned a rating of 4 or 5) and to replacing paper shipping documents with electronic ones, as well as to appropriately sized packaging for the product (83.8% of responses each). Reducing the use of plastic in product packaging (e.g., using paper tape) was equally highly rated, with as many as 83.1% indicating this. Among other pro-environmental activities of companies related to the delivery of goods, 76.1% of respondents highly rated the delivery of parcels to parcel machines or other pick-up points. Eco-friendly packaging (76.2%) and eco-friendly fillers (73.1%) also proved to be very important. The possibility of returning reusable packaging is appreciated by 68.4% of respondents, while delivering goods by electric or hybrid car is appreciated by only 43.8% of respondents. These activities are at the same time the least appreciated, with about 10% of people in both cases indicating they are the least important.

Research by other authors also confirms that consumers are attaching increasing importance to the type of packaging of the products they buy. They require, above all, that it be eco-friendly and recyclable packaging (e.g. Nguyen et al., 2020; Mobile Institute, 2021).

Table 4.

Assessment of the importance of selected environmentally friendly aspects of companies' supplies and operations (scale from 1 to 5, where 1 means - not important in general, and 5 - very important)

Pro-environmental aspects of company supplies and operations	1	2	3	4	5
Eco-friendly packaging	2 (1.5%)	4 (3.1%)	25 (19.2%)	33 (25.4%)	66 (50.8%)
Eco-friendly fillers	4 (3.1%)	6 (4.6%)	25 (19.2%)	29 (22.3%)	66 (50.8%)
Properly sized packaging for the product	1 (0.8%)	4 (3.1%)	16 (12.3%)	28 (21.5%)	81 (62.3%)
Limiting the use of plastic in packaging (e.g., paper tape)	2 (1.5%)	4 (3.1%)	16 (12.3%)	27 (20.8%)	81 (62.3%)
Ability to return reusable packaging (e.g., using a parcel machine)	11 (8.5%)	9 (6.9%)	21 (16.2%)	22 (16.9%)	67 (51.5%)
Delivery of goods by electric or hybrid car	19 (14.6%)	14 (10.8%)	40 (30.8%)	25 (19.2%)	32 (24.6%)
Delivering shipments to parcel machines or other pick-up points	5 (3.8%)	5 (3.8%)	21 (16.2%)	38 (29.2%)	61 (46.9%)
Combining shipments in a single delivery	3 (2.3%)	2 (1.5%)	11 (8.5%)	26 (20.0%)	88 (67.7%)
Converting paper shipping documents into electronic ones	4 (3.1%)	4 (3.1%)	13 (10.0%)	22 (16.9%)	87 (66.9%)

Source: Own elaboration based on the conducted surveys.

Taking into account environmental legislation, current trends and consumer expectations, companies in the logistics industry are taking many measures to reduce their harmful impact on the environment (e.g. Zowada, 2020; Kołodziejczak, Kowalska, Misztal, 2022). In the conducted surveys, respondents were asked to identify future logistics solutions that they believe are a priority to implement. As can be seen in Table 5, the highest percentage of respondents believe that the organization of smart and green warehouses, equipped, for example, with photovoltaic panels, smart lighting, rainwater recovery or recycling, is by far

the most important measure in the current times. Also highly rated were upgrading the transportation fleet to a more environmentally friendly one (44.6%), optimization of the routes traveled, and a packaging recirculation system for e-stores (37.7% each). Slightly more than 32.3% of respondents identified the creation of central warehouses for logistical handling of re-commerce platforms as a pro-environmental measure of priority. About 20% of respondents believe that companies should focus on the introduction of eco-friendly parcel vending machines or the use of shared micro-hubs in city centers that allow delivery and courier companies to make the last leg of deliveries using bicycles. Measures related to the introduction of autonomous cars appeared to be the least important (10.8%).

Table 5.

Priorities for the introduction of forward-looking green logistics solutions according to respondents

Examples of solutions	Responses	Share %
Use of shared micro-hubs for city centers that allow delivery and courier companies to make the last leg of deliveries using bicycles	28	21.5%
Creating central warehouses for logistical handling of re-commerce platforms (selling used products after they have been inspected, refreshed, repaired, labeled, etc.).	42	32.3%
Smart and eco-friendly warehouses, equipped with, for example, photovoltaic panels, smart lighting, rainwater recovery, recycling, etc.	67	51.5%
Upgrading the transportation fleet to a more environmentally friendly one	58	44.6%
Optimization of routes traveled (choosing the fastest and best route to the destination)	49	37.7%
Introducing eco-friendly parcel vending machines (e.g., One Box, powered by electricity)	31	23.8%
Re-circulating packaging system for e-stores (reusable packaging, return of cardboard boxes via parcel machines)	49	37.7%
Autonomous city buses	27	20.8%
Autonomous cars	14	10.8%
Other	4	3.1%

Source: Own elaboration based on the conducted research.

With the significant increase in social and economic interest in sustainability and environmental protection, the phenomenon of greenwashing, a marketing practice in which organizations mislead consumers about the real impact of their actions on the environment, has also increased (de Freitas Netto et al., 2020; Pimonenko et al., 2020). Many market participants, suspicious of pro-environmental promises, are becoming increasingly aware of a reliable assessment of companies' actions in the context of sustainability. The survey was conducted to find out the awareness of greenwashing in the logistics industry and the most common symptoms of this practice according to respondents. It was shown that almost half of the respondents are aware of greenwashing (49.2%), as many as 36.9% do not know, and 13.8% are not aware (Figure 3).

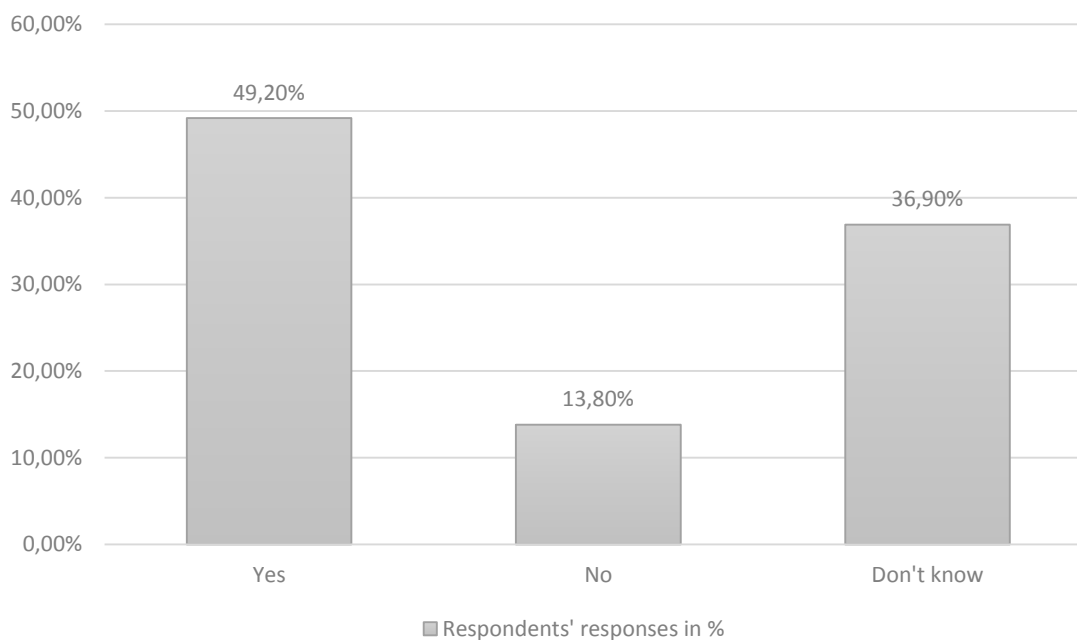


Figure 3. Awareness of greenwashing in the logistics industry.

Source: Own compilation based on the conducted surveys.

As can be seen in Table 6, the largest number of respondents, that is, 46.9%, indicated that the most common practice of this phenomenon is the misuse of meaningless phrases (e.g., “eco-friendly,” “sustainable supply”), without explaining what the environmentally friendly nature of the service consists of. About one-third of respondents pointed to promoting a business as green without certifying this fact, such as with an appropriate certificate, as a symptom of greenwashing. In turn, about one-quarter of respondents pointed to providing selective data to certify green operations, omitting inconvenient data from information about the company. Slightly more than 20% believe that the use of overly exaggerated, suggestive advertisements for services implying green values are the most common actions associated with the green lying phenomenon in question. About 16% of respondents also considered that the use of scientific jargon, incomprehensible to the average consumer, and the exaggeration of the scope of the company’s green solutions can be considered a greenwashing phenomenon in these organizations. It is worth noting that 17.7% do not notice this phenomenon in the activities of companies in the logistics industry.

Table 6.

Symptoms of greenwashing in the activities of the logistics industry in the opinion of respondents

Activities	Responses	Share %
I do not notice that the phenomenon occurs in the activities of companies in the logistics industry	23	17.7%
Misuse of meaningless phrases (e.g., “eco-friendly”, “sustainable supply” without explaining what the environmental friendliness of the service consists of)	61	46.9%
Promoting a business as eco-friendly without any proof of the eco-friendliness of its services in the form of certificates	46	35.4%
Omitting inconvenient information from details about the company	32	24.6%

Cont. table 6.

Using scientific jargon that is incomprehensible to the ordinary consumer	21	16.2%
Using overly exaggerated, suggestive advertisements for services that suggest green values	30	23.1%
Exaggerating the scope of a company's green solutions (publicizing individual green solutions)	22	16.9%
Providing selective data to certify environmental performance	34	26.2%
Other actions	5	3.8%

Source: own elaboration based on the conducted surveys.

4. Summary

The main objective of this study was to analyze Polish consumers attitudes toward sustainable logistics. The specific objectives were to learn Polish consumers' preferences toward various forms of sustainable urban transportation and environmentally friendly forms of delivery, to identify the most important pro-environmental activities of companies related to the shipment of goods, as well as the priority solutions for sustainable logistics in the opinion of the respondents. In addition, an important goal of the study was also to find out respondents' awareness of green goods delivery and greenwashing.

It was shown that respondents overwhelmingly rated their green attitude well. The most frequently chosen sustainable means of transportation around the city is the electric bicycle or electric scooter. Respondents were characterized by high environmental awareness in the context of product delivery. According to them, the greenest form of delivery is parcel machine delivery. They also attributed high pro-ecologic importance to companies' activities related to combining shipments in a single delivery, replacing paper shipping documents with electronic ones, and properly sized packaging for the product. Among the priority solutions for sustainable logistics, the organization of smart and green warehouses and the modernization of the transport fleet were singled out above all. It is worth noting that almost half of the respondents assessed that they were aware of greenwashing in the logistics industry, and in their opinion the phenomenon manifests itself mainly in the misuse of meaningless sustainability phrases.

This research provided a lot of practical information that can be used in the business environment. Firstly, by knowing consumers' preferences, companies can better adapt their marketing strategies to expectations, as well as developing more attractive product offerings. In addition, the research points to the need for social campaigns to educate consumers about sustainable logistics, as well as greenwashing.

Further research should focus on consumer characteristics that consider their socioeconomic profile, which will enable the development of more tailored marketing strategies to promote sustainable practices. In addition, it is worth looking for ways to engage consumers in companies' pro-environmental activities by exploring their opinions on a variety of prosumption-related activities. Among the limitations of the research are the small sample size of the empirical study, as well as the limited nature of the survey questionnaire.

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