Selected Environmental Aspects in the Context of the Concept of CSR in Logistics Companies

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Abstract: Corporate social responsibility is a complex concept, where ecology is one of the key elements. From the point of view of logistics, care for the environment and respect for non-renewable resources is a particularly important issue. The essence of logistics is the movement of people and cargo, that is possible only by using a certain amount of energy. Companies operating in this sector, by definition cannot, therefore, be neutral with respect to the environment. They can, however, minimize the ecological footprint. In practice, it turns out that the involvement of businesses in this area is varied.

The aim of the article is to assess ecological facet of logistics companies' activity and their differentiation in this area according to their specialization. Statistical analysis of selected environmental aspects shows a weak ecological score of logistics companies compared to other industries. What is more, ecological score of logistics businesses is varied between specialization groups. In overall, the leading group of companies is transportation infrastructure which reached the highest average score. The only sector which significantly lags behind the others is road and rail. It turns out that the most problematic ecological aspects for assessed companies are: reduction of hazardous waste and air emissions other than GHG, and environmental requirements in relation to suppliers.

Keywords: corporate social responsibility, CSR, ecology, green logistics, logistics

JEL codes: O13, L91, L92, L93

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1. Introduction

The concept of corporate social responsibility (CSR) has become a popular and sometimes controversial issue in recent years. According to some researchers, it allows the achievement of

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sustainable development (Szlávik and Csáfor, 2012: 208). Opponents postulate, that this is only a marketing tool aimed at improving the image of the company (Reich, 2008: 39). However, projects like e.g. building schools in third world countries, financing the culture, aid for victims of natural disasters, and taking care of rare species, contribute to solving important social problems regardless of the motives for taking them. There are two types of companies present on the market. Some of them use CSR solely for their own purposes and some of them recognise their mission as more than just profit maximization.

A company is socially responsible when in the process of realization its own goals, it also considers the interests of social and natural environment. Companies operating in the field of logistics always stand in some sense in contrast to ecology.Movement of people and goods in each case requires to generate a certain amount of energy, and thus the consumption of raw materials. This cannot be avoided but it is possible to shape the processes within the organization and use technologies which, as far as possible, minimize the ecological footprint left by the company. Logistics organizations should recognise their responsibilities in this regard and conscientiously implement them. Otherwise, the costs associated with generated negative externalities will be borne by external actors operating in environment. In practice, some enterprises do not perform their duties in the field of ecology, and some do it in an incompetent way.

The purpose of this article is to assess ecological facet of logistics companies' activity and their differentiation in this area according to their specialization. Research hypothesis is the idea that the level of corporate social responsibility of logistics in the field of ecology is varied accordingly to the profile of activity. This hypothesis was verified by statistical analysis of the data and literature review. It is expected this research will provide an image of the activity of logistics companies in the field of ecology and will highlight the most neglected aspects.
Before analyzing the statistical data on the environmental aspects in logistics companies' activity it is necessary to take a closer look at the concept of CSR to understand its meaning.

2. The concept of CSR

In neoclassical theory, businesses are seen as black boxes processing input streams into output streams. At the core of this process is the pursuit to maximize the profit (Lichtarski, 2001: 27). Newer theories of economics and management point out that the nature of the business, as well as

their role in society, are now more complex. Each company operates in a specific social context, and is associated with entities located in its vicinity. These entities are called stakeholders, that is, "any individual or group that maintains a stake in an organisation in the way that a shareholder possesses shares" (Fassin, 2008: 7). Taking into account the goals and objectives of stakeholders in the business allows companies to get so-called social "license to operate" (Fontaine et al., 2006: 25). It is a prerequisite of survival, which is now the overarching objective of the organization.

Concern for the welfare of stakeholders is a key element of many definitions of CSR. For example, due to Business for Social Responsibility (Dahlsrud, 2003: 8)social responsibility is "achieving commercial success in ways that honour ethical values and respect people, communities and the natural environment". According to K. Buhmann (2006: 189), social responsibility is doing more than it is determined by law regulations. It is a set of voluntary activities undertaken by company.

One of the most popular definitions of CSR, is the one formulated by the European Commission (2011: 6), which describes this phenomenon as "the responsibility of enterprises for their impacts on society". This definition mention only one area of CSR. According to S. Young (2005: 75), social responsibility is a broader concept and includes aspects such as: the natural environment, society, the interests of employees, ethical values, as well as law regulations. In public debates, at times also in scientific discussions, CSR is wrongly reduced to the dilemma between the economy and the natural environment, and other areas are completely omitted. It should be noted, however, that CSR applies not only to the environmental aspects, which are the subject of analysis in this article. In addition, the objectives of economic enterprises and objectives of an environmental nature, are not necessarily opposed to each other. Some authors see the proceedings in a responsible manner necessary to achieve long-term economic growth (Zapłata and Kaźmierczak, 2011: 160-174).

The impact of CSR on the achieved economic success is observed in various fields. There are numerous studies in the literature showing the benefits offered to companies operating in a responsible way. It turns out that the social responsibility of the company is the third most important factor affecting the involvement of employees (Towers Perrin, 2007: 9). A good reputation is also an important incentive for candidates who want to become its employees. This allows for the employment of workers with above-average qualifications, and obtain lower cost of the recruitment process (Nurn and Tan, 2010: 364). Greater flexibility in relation to changes in the environment is

yet another example of the direct benefit of companies functioning in a responsible way (Sprinkle and Maines, 2010: 449-451).

These and other, not mentioned in this article, benefits are often the motive of implementation and realization of CSR strategies by companies. According to the theory of CSR 2.0 (Visser, 2011: 33), these entities go through four stages of social responsibility:

- value creation,
- good governance,
- societal contribution,
- environmental integrity.

In the first stage the companies are focused on creating the economic value whichinvolves not only the maximization of the profit, but also the economic development in broader meaning. This is the time for making investment in physical and human capital. At this stage, socially responsible companies should ask themselves two questions. Firstly, whether they produce goods or services which represent real value from the point of view of society, or are they characterized by poor quality, and thus they are only a waste of resources? Secondly, what is the profit distribution between the groups which contributed to obtain it?

The second stage is the elaboration of ethical management practices and transparency of operations. Companies should not only act in a responsible manner, but also provide all stakeholders with the necessary information about their business processes. Under the scope of informing, there is the reporting of current operations and also the preparation of documents defining the principles of ethical conduct.

At the next stage, the company focuses on social objectives. Internally, the organizations try to implement appropriate practices in relation to employees and in relation to external stakeholders companies undertake charitable activities. In this phase, the company also becomes the subject that promotes responsible practices. This is due to the norms and standards implemented in the contracts concluded within the logistics chain.

Eventually, the company reaches the final stage, which is environmental integrity. Organizations integrated with the natural environment take actions on a much broader scale rather than just minimizing the ecological footprint. The ambitious goals set by some companies are waste-free production and using 100% of energy from renewable sources. Achieving these goals, for some entities, is still not a sufficient step to full integration with the natural environment. Apart

from only wanting to reduce their negative impact on the environment, they also want to contribute to its development. In this regard they implement various types of environmental projects aimed, inter alia, to the protection of biodiversity and care of the suffering animals.

In practice, companies do not always overcome the above cycle in the designated order. It is also difficult to find examples of entities that cope with all the demands at each stage. Especially with regard to environmental aspects. Presented theoretical concept is only the model that can be some kind of reference point for companies. The very formulation of the objectives relating to environmental protection is the first step to running the business in ecological manner. The rest of this article shows how logistics companies, representing different business profiles, deal in this regard.

3. Statistical analysis of selected environmental aspects in logistics companies

For the purposes of this article 86 companies from 4 continents (Asia: 35, Europe: 34, North America: 16, Australia and Oceania: 1) and 22 countries were assessed in the light of their activity in the field of ecology. All analyzed companies are classified as big businesses. Data was obtained from the database of GES Investment Services and is valid for 2016. The quality of information published by each company was assured by independent auditor.

All examined companies represent the logistics sector, but due to the business profile, they were divided by research analysts into six groups according to Global Industry Classification Standard methodology (Standard & Poor's and MSCI, 2006: 13):

- air freight,
- airlines,
- marine,
- road and rail,
- transportation infrastructure.

For comparative purposes the assessment also includes general indicators for the entire sample.

The study encompassed selected ecological aspects indicated by Global Reporting Initiative (2015: 52-63) which is a main benchmark for organizations in CSR activity and publishing information about their sustainability. The process of selection was performed to choose only those

parameters which are relevant and can be measured in logistics industry. Total score of the assessment of companies activity in the field of ecology consists of two fundamental aspects:

- environmental preparedness to conduct business in an ecological manner (6 indicators): ISO 14001/EMAS certification, the range and quality of published environmental information, environmental requirements in relation with suppliers, the scope of implementation of environmental management system, environmental policies and targets, environmental routines;

- environmental performance (8 indicators): changes in greenhouse gases (GHG), other gases, waste, hazardous waste emissions over years; energy, fuel consumption over years, approach to hazardous waste management, environmental impact assessment in project development process.

The first issue concerns the theoretical aspects – the implementation and the compliance with the formal environmental regulations. In other words, it is assessed what the firm would like to achieve and what is being done in the process of reaching the objectives of environmental concerns. The second aspect reflects only the actual operation of the company – the scale of its impact on the environment. The crucial part of this indicator is the use of natural resources and generation of pollution.

The approach to the study was deductive – from the total ecological score to two constituent indicators and their basic components. The main way to measure and compare results was arithmetic mean as there were no distant observations in analyzed group of companies. Other important measure was the count of individual scores equal to zero which showed the number of passive companies in certain aspect. As a measure for score differentiation the coefficient of variation was used as a basic tool complemented by standard deviation.

The maximum total score in the field of ecology, which can be achieved by the company is 3. None of the analyzed entities came close to this value. The highest rating in the test was 2.08, with an average of 0.93 and a standard deviation of 0.52.

Notes of two groups were close to the average score calculated for the whole sample: air freight (0.95) and marine (0.92) (Figure 1.). Against this background, the group of road and rail got the lowest score, with 0.69 on average. The most ecological companies turned out to be from the group of transportation infrastructure, which received an average score equal to 1.14.

Figure 1. Total ecological score
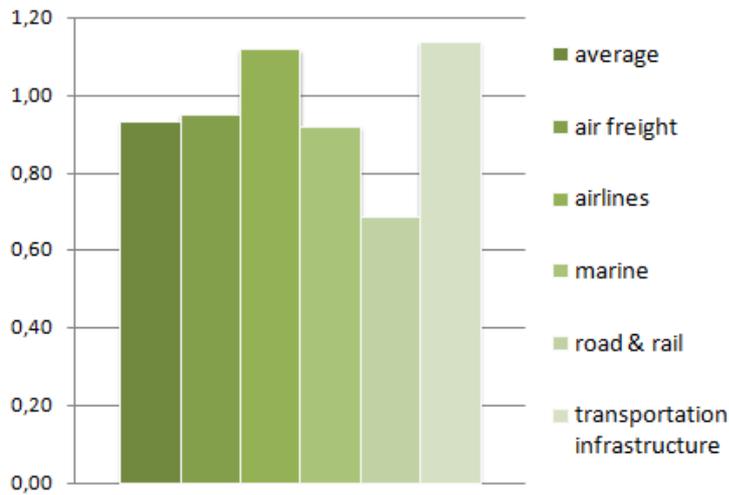
Source: Author's own elaboration.

Coefficients of variation were also calculated for all five groups. They take values from 42%, in the case of airlines, to 67%, for road and rail. It also turned out that a lower average rating went hand in hand with a greater diversity of individual assessments of companies within the group. 5 companies got score equal to zero (3 in road and rail, 1 in marine group and 1 airline) which means that they did not conduct any environmental activities in considered indicators.

The first out of two aspects, that made up the total of the above assessment, was a preparedness to conduct business in an environmentally friendly manner.

Figure 2. Ecological preparedness score
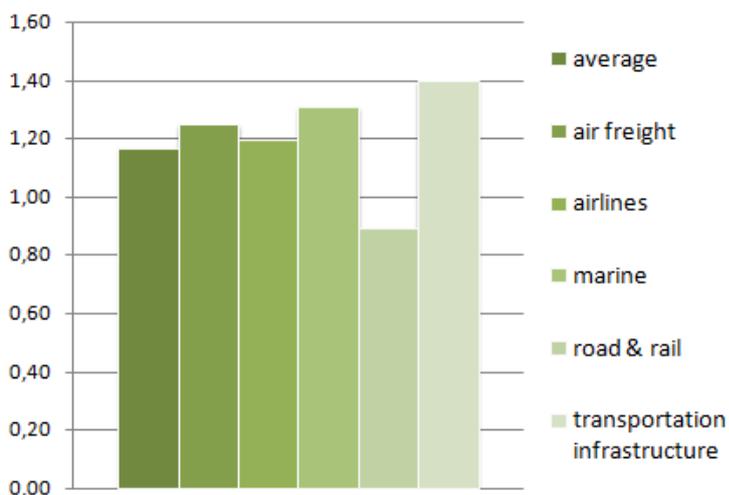
Source: Author's own elaboration.

In this case, the average rate for all entities was 1.17 with a standard deviation of 0.64. The maximum value observed was 2.33. Again, the lowest average scores were obtained by road and rail (0.90). It was the only group distant to the others. Transportation infrastructure reached the highest average score (1.40) and marine turned out to be the second group in environmental preparedness (1.31) (Figure 2.).

In this indicator, the coefficient of variation was found to be the lowest for transportation infrastructure and airlines (42%). The highest coefficient of variation was calculated in the case of road and rail (63%). When it comes to passive organizations – these were the same 5 as in total ecological score.

Strong points of the whole group of logistics companies in ecological preparedness were: environmental management system, environmental routines and the scope and quality of published environmental information. Relatively not many companies were certified to ISO 14001 or EMAS, but this is not the main problem. What many companies did not pay attention for was environmental requirements in relations with suppliers what was also highlighted in studies from previous years (Piskalski, 2015: 37).

The analysis of basic indicators did not lead to reasons for existing differences among groups in ecological preparedness. There were no single indicators which could be a cause of existing differences. The dispersion of scores in basic indicators calculated for all groups was similar to this for the whole sample only the level of the score is varied. It means that in most cases better ecological preparedness arose from proportionally bigger environmental activity in each basic indicator.

The assessment of the actual impact on the environment – ecological performance, was another variable in determining the rating companies in the field of ecology. Average scores obtained for the whole sample was 0.70, while the standard deviation equals to 0.48. The highest observed score was 1.83.

Figure 3. Ecological performance score
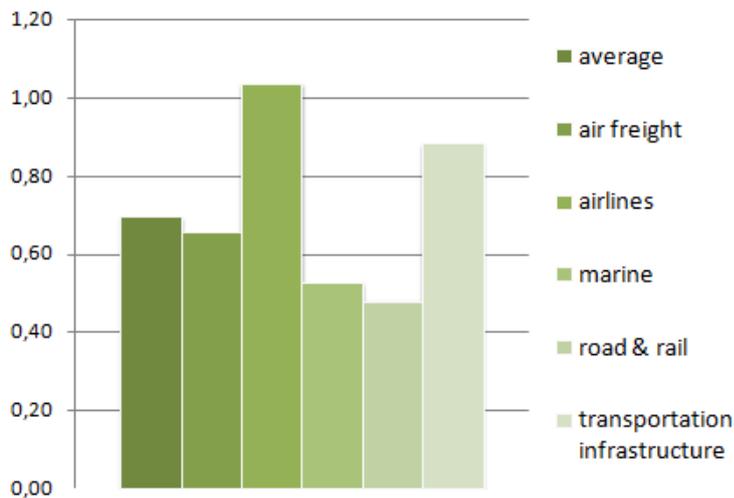
Source: Author's own elaboration.

According to the analyzed data, the most negative environmental impact was found in the case of road and rail companies (0.48) and marine (0.53) (Figure 3.). The result for air freight (0.66) was relatively close to the average for all groups. In this indicator transportation infrastructure also reached a relatively good result – 0.88 but it was significantly lower than average score for airlines (1.04). The most internally diversified were road and rail companies (V = 90%), and the least airlines (V = 42%). 11 organizations were passive in improving ecological performance – 6 from road and rail group, 3 marine, 1 airline and 1 air freight company. It is also worth mentioning that there were no passive companies only in transportation infrastructure group.

The analysis of basic indicators showed that in terms of ecological performance companies did well in reducing energy consumption and GHG emissions. These are the aspects which have been the most popular in scientific and public discussion nowadays and they are a subject of law regulations or international projects. Companies can get additional financing sources for investment aimed at reducing GHG emissions and energy consumption from projects like Operational Programme Infrastructure and Environment 2014–2020 (Ministry of Economic Development, 2014: 24). On the other hand ignoring those two aspects can generate significant costs not only in the financial dimension. The problem is observed when it comes to hazardous waste production. Less than 5% of assessed companies scored more than zero in this indicator, it means that in 95% of cases production of hazardous waste grew or companies did not want to share information about this parameter. Similar problem concerns the way hazardous waste is handled.

The above analysis refers to the results achieved by the group of companies in the individual indicators. In order to obtain a more complete picture of environmental responsibility in the analyzed sample, we should also find out in which of the indicators the results achieved by groups were the most similar. Lower discrepancy in the results obtained by each group was observed in the ecological preparedness. The variation coefficient in this case was 13.9%. Greater differentiation between the analyzed groups was observed in the actual impact on the environment – variation coefficient equal to 32.3%. Differentiation in the aggregated ecological indicator was 18.9%.

As for the total ecological score and the two sub-indicators, the smallest deviation from the average for the entire sample were characterized by air freight, with an average coefficient of variation equal to 4.7%. The results achieved by the road and rail differ the most from the average for the whole sample (24.5%).

In the case of internal differentiation of results, the most similar results were observed in the airlines group. More varied were consecutively: transportation infrastructure, air freight, marine and road and rail. The average value of the coefficient of variation for each group, in this case ranged from 43% to 73%.

In addition to the analysis of the results achieved in the individual indicators, it is also worth looking at another facts because there can be an interesting relationship between the ecological preparedness of the companies and their ecological performance. Now, the question is whether organizations, which have implemented programs and environmental strategies, actually leave a smaller ecological footprint than the other ones. For this purpose, the Pearson correlation coefficient was calculated for two variables: the score in ecological preparedness, and the score in ecological performance. The Pearson correlation coefficient for the entire sample was 0.69, which indicates a strong positive correlation. It turns out that for companies included in the survey, less impact on the environment coincided with the implementation of various types of formal tools environmentally friendly. This correlation can be considered reliable because the test showed statistical significance at the level of 0.05 and at the same time there were no outliers.

Pearson correlation coefficients were calculated also for all of the groups.

Figure 4. Pearson correlation coefficient between ecological preparedness and ecological performance
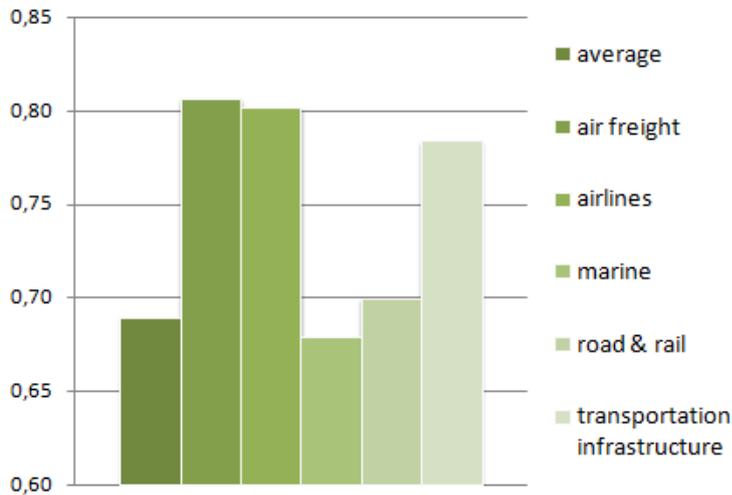
Source: Author's own elaboration.

For marine and road and rail transport the values were close to the average for the entire sample, respectively: 0.68; 0.70. Higher index values occurred in the case of transportation infrastructure (0.78), airlines (0.80) and air freight (0,81) (Figure 4.). Although all correlations have statistical significance, far-reaching conclusions should not be drawn based on them – they were calculated for relatively small samples.

Verifying whether this correlation is due to cause-and-effect relationship requires further investigation. In order to eliminate the impact of external variables, research sample should consist of companies which do not only represent a similar scope of activity but also those, that are of similar size and operate in the same country. At this stage, we are not able to attempt to outline the direction of the dependence between examined variables. It seems more likely that the implementation of environmentally friendly organizational tools translates into a smaller negative impact on the natural environment rather than small ecological footprint is the cause of the implementation of programs and environmental standards. There is also a possibility that in this case the dependence between variables is bilateral.

4. Conclusion

The motive of operation of logistics companies is the achievement of specific objectives. In the context of CSR, it does not matter whether it is foremost neoclassical profit maximization, survival

in the market, or other pursuits. What is important is that the companies have to bear social responsibility for their actions and not encumber other with costs associated with generated negative externalities.

With the results based on findings, we can conclude that the studied group of companies significantly differs in the light of results achieved in the three analyzed indicators of ecological responsibility. In the overall environmental assessment rate coefficient of variation for individual groups was close to 20%. It should be noted that the smallest differences between the groups were observed in the range of theoretical preparedness for operations in an environmentally friendly manner - 16%.

Variation of the results within individual groups was significantly higher, however, these measures are not comparable. Aggregated indicators at the group level represent averages when results achieved by single companies were sometimes equal to extreme values. However, it is possible to compare the internal variation among groups. The lowest variability in achieved results characterized the group of airlines. The highest average coefficient of variation was calculated for road and rail.

It is difficult to clearly identify a group of companies which can be called the most environmentally responsible. It is true that the total result obtained in the rating and the lack of passive companies put the transportation infrastructure group in the first place but there is also one important fact which should be taken into consideration. The quality of life of the society is affected directly by the actual condition of the natural environment, rather than strategies and regulations adopted inside organizations. Seen from this point of view, the most socially responsible are researched airlines because they leave relatively small ecological footprint. Interestingly, this is also a group of theoretically the second-worst ecological preparedness.

Based on the results some managerial implications can be made. Namely, companies in all assessed groups need to be more involved in managing environmental aspect of relations with their suppliers what has been a major problem not only in logistics but in many other industries (Witkowski and Kurowski, 2016: 198-206). Suppliers should also be chosen using ecological criteria and they should fulfill specific norms and regulations. Another task for managers is to focus not only on GHG emission and energy use but to take a wider look on other environmental aspects of business activity. Hazardous waste should be recognized with a higher priority – finding safe ways of utilization and limiting its production.

Theoretical preparedness analyzed in the study is considered as plans that were designed to be translated into a smaller negative impact on the environment in the future. Studies have shown that in assessed sample this theoretical prospect may have a logical explanation. The presence of statistically significant and strong positive correlation between theoretical ecological preparedness of the company, and the ecological footprint is an introduction to the next stage of research.

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Mateusz Kurowski

Wybrane aspekty środowiskowe w kontekście koncepcji CSR w przedsiębiorstwach logistycznych

Streszczenie

Społeczna odpowiedzialność to złożona koncepcja, której jednym z głównych elementów jest ekologia. Z punktu widzenia logistyki troska o środowisko i surowce naturalne jest szczególnie istotnym zagadnieniem. Jej istotę stanowi bowiem przemieszczanie osób oraz ładunków, co możliwe jest wyłącznie poprzez wykorzystanie określonej ilości energii. Przedsiębiorstwa działające w sektorze logistyki nie mogą więc być neutralne wobec środowiska. Mogą one natomiast minimalizować swój ekologiczny ślad. W praktyce okazuje się, że zaangażowanie podmiotów w tego typu inicjatywy jest zróżnicowane.

Celem artykułu jest zbadanie ekologicznego wymiaru działalności przedsiębiorstw logistycznych oraz ich zróżnicowania w tym zakresie z uwzględnieniem profilu działalności. Analiza statystyczna wybranych aspektów środowiskowych ukazała relatywnie niskie wartości wskaźników ekologicznych przedsiębiorstw logistycznych w porównaniu do innych branż. Co więcej, wyniki przez nie osiągane okazały się być zróżnicowane między poszczególnymi branżami. Najbardziej ekologiczne okazały się być podmioty działające w zakresie infrastruktury transportowej. Grupą o wyraźnie najniższych wynikach był sektor transportu drogowego i kolejowego. Najwięcej problemów badanym przedsiębiorstwom sprawiły: redukcja odpadów niebezpiecznych i emisji gazów innych niż cieplarniane oraz stawianie wymogów środowiskowych dostawcom.

Słowa kluczowe: społeczna odpowiedzialność, logistyka, ekologia, zielona logistyka.