Electronic scientific and practical journal

# INTELLECTUALIZATION OF LOGISTICS AND SUPPLY CHAIN MANAGEMENT

#25 (2024)
June '24

WWW.SMART-SCM.ORG
ISSN 2708-3195
DOI.ORG/10.46783/SMART-SCM/2024-25

ISSN 2708-3195
9 772708 319005

Electronic scientific and practical collection
INTELLECTUALIZATION OF LOGISTICS AND SUPPLY CHAIN MANAGEMENT

# Electronic scientific and practical publication in economic sciences

Electronic scientifically and practical journal “Intellectualization of logistics and Supply Chain Management” included in the list of scientific publications of Ukraine in the field of economic sciences (category "B"): **Order of the Ministry of Education and Culture of Ukraine dated October 10, 2022 No. 894 (Appendix 2)**

**Field of science:** Economic.
**Specialties:** 051 – Economics; 073 – Management

**ISSN** 2708-3195
**DOI:** https://doi.org/10.46783/smart-scm/2024-25

The electronic magazine is included in the international scientometric databases:
Index Copernicus, Google Scholar

**Released 6 times a year**

№ 25 (2024)
June 2024

Kyiv - 2024

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In 2020, the International Center for Periodicals (ISSN International Center, Paris) included the Electronic Scientific and Practical Edition "Intellectualization of logistics and Supply Chain Management" in the international register of periodicals and provided it with a numerical code of international identification: ISSN 2708-3195 (Online).

Recommended for dissemination on the Internet by the Academic Council of the Department of Logistics NAU (No. 7 of February 26, 2020). Released 6 times a year. Editions references are required. The view of the editorial board does not always coincide with that of the authors.

Electronic scientifically and practical journal "Intellectualization of logistics and Supply Chain Management" included in the list of scientific publications of Ukraine in the field of economic sciences (category "B"): ***Order of the Ministry of Education and Culture of Ukraine dated October 10, 2022 No. 894 (Appendix 2)***

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DOI: https://doi.org/10.46783/smart-scm/2024-25
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The electronic scientifically and practical journal
"INTELLECTUALIZATION OF LOGISTICS AND SUPPLY CHAIN MANAGEMENT",
ISSN 2708-3195

24-32
v.25 (2024)
https://smart-scm.org

UDC 338.47
DOI: https://doi.org/10.46783/smart-scm/2024-25-2
JEL Classification: M21, M11, L21.
***Received***: 18 May 2024

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# INCREASING THE LEVEL OF ENVIRONMENTAL FRIENDLINESS OF COMPANIES THROUGH DECARBONISATION

***Vladyslav Marchenko, Dmytro Bugayko. «Increasing the level of environmental friendliness of companies through decarbonisation».*** *In our time, the question of environmental friendliness of companies is regularly on the agenda of the world community. Today, it is highly relevant and concerns both ordinary citizens and all possible business representatives. With each new year, more and more people are beginning to pay attention to the problems related to environmental pollution and climate change. They are global, existential challenges for humanity, and therefore require high-quality ideas, fast, effective and truly complex counteractions that can improve the current state of affairs. The gradual deterioration of the ecological situation in the world is leading to a rise in interest to these problems and the search of possible variants that can minimise the negative anthropogenic impact on the environment. One of the most effective solutions today is the decarbonisation of companies' activity, and therefore, scientists and researchers need to continue to study and analyse this complex question, to look for possible prospects for their development in the direction of «green» initiatives.*

***Keywords****:* ecology, decarbonisation, optimisation, development, efficiency, prospects, logistics, business, technologies, companies

***Владислав Марченко, Дмитро Бугайко. «Підвищення рівня екологічності компаній за рахунок проведення декарбонізації».*** *В наш час, питання екологічності компаній регулярно стоїть на порядку денному світової спільноти. Сьогодні, воно є високоактуальним і турбує, як звичайних громадян, так і всеможливих представників бізнесу. З кожним новим роком, все більше і більше людей починають звертати увагу на проблеми, що пов'язані з забрудненням навколишнього середовища та зміною клімату. Вони є глобальними, екзистенційними викликами для людства, а тому потребують високоякісних ідей, швидких, ефективних та по-справжньому комплексних контрдій, що здатні покращити поточний стан справ. Поступове загострення екологічної ситуації в світі*

*призводить до зростання інтересу до даних проблем та пошуку можливих варіантів, що здатні мінімізувати негативний антропогенний вплив на навколишнє середовище. Одним з таких найбільш ефективних рішень сьогодні є декарбонізація діяльності компаній, а тому, науковцям та дослідникам необхідно продовжувати вивчати та аналізувати це комплексне питання, шукати можливі перспективи для їх розвитку в напрямку «зелених» ініціатив.*

***Ключові слова:*** екологія, декарбонізація, оптимізація, розвиток, ефективність, перспективи, логістика, бізнес, технології, компанії.

**Introduction.** In our time, the idea of environmental protection is more relevant than ever before, both among ordinary people and business. The situation has become so serious that in the nearest future, ignoring the problems connected with environmental pollution and climate change may become not just difficult, but even shameful. Today, they are real challenges for humanity, the negative consequences of which can already be clearly seen in many countries around the world. Realising the global nature of this problem has led to the search for solutions that can correct the situation. One of such variants was the decarbonisation of companies' activity. Nowadays, this idea has gained a great popularity. It represents a modern, prospective measure aimed at effective counteraction to the above-mentioned processes. Its high-quality realisation today is closely linked to the spheres of logistics and management, and the level of success of its completion depends on many factors: used innovations, scientific achievements, implemented «green» technologies, comprehensive reforms, the level of environmental awareness of citizens, etc. The issue of decarbonisation of companies' activity has gained a critical value and that is why it is so important to continue to research, study and analyse it.

**The purpose of the article** is to explain the idea of decarbonisation, provide a definition of this term, and reveal its global significance. This article will explain not only why it is so important to develop a decarbonisation plan and monitor the progress of its implementation, but also outline the key variants that can be used to achieve this successful decarbonisation. Based on the results of the conducted research, a conclusion will be formulated.

**Presentation of the main results.** Nowadays, decarbonisation is truly important. Rapid and focused decarbonization is essential to the future of our planet [1]. It should be emphasised that this term has different definitions. Its interpretation usually depends on the scientific approach and research direction. Some scientists concentrate attention when describing decarbonisation on the process of reducing greenhouse gas emissions into the atmosphere, while others trying to focus on a set of various measures aimed at reducing anthropogenic greenhouse gas emissions into the atmosphere. Greenhouse gases in our atmosphere act like the glass in a greenhouse, letting light through but stopping heat from escaping [2].

It is necessary to consider this question with all possible seriousness and responsibility. Closing eyes and sometimes even banal indifference to it in the past has led to a dramatic worsening of this issue. Now the resolution of this situation depends on us, and we cannot postpone it any longer. Greenhouse gases from human activities are the most significant driver of observed climate change since the mid-20th century [3].

The long-term policy of ignoring this moment was a huge mistake. Therefore, it is not surprising that so much attention today is paid to the role of business in these processes. Businesses are major contributors to global emissions and play a crucial role in decarbonizing the economy [4].

For this reason, in this context, the key goal facing humanity is to reduce greenhouse gas emissions into the atmosphere that arise

from the operational activity of modern companies. An example of greenhouse gases that occur during the company's operational activity can be clearly seen in Fig. 1.

Figure 1 – Greenhouse gases that occur during the company's operational activity
*Source: https://www.power-technology.com/news/us-greenhouse-gas-emissions-rose-by-1-3-in-2022-report/*

At present, among the possible variants of improving companies' environmental friendliness, the idea of decarbonisation is very popular and remains a top priority. Of course, this task is undoubtedly not easy and actually requires significant efforts from these companies, but at the same time, it opens up an extremely wide range of opportunities for efficient development, increase of competitiveness and further growth.

Decarbonisation requires a thoughtful approach to all aspects of companies' activities, their key processes, and especially their logistics. By improving the logistics aspect, companies are able to achieve significant positive results in this regard.

Everything starts with a very detailed analysis of all the company's operations, which is primarily aimed at identifying the main sources of greenhouse gas emissions and finding potential solutions that can minimise them. Afterwards, taking into account the company's available resources and capabilities, the results of the analysis are used to formulate a clear action plan in the time perspective, which will take into account future adjustments in its activities, step-by-step implementation of various ecological projects, introduction of innovative ideas, and changes in relevant norms and standards.

Besides, it is important not only to set the desired objectives, but also to create a full-fledged control system that will monitor the company's progress in achieving them. Fortunately, nowadays, the use of various digital technologies can not only significantly simplify this process, but also provide an accurate and detailed check of the execution

of the scheduled stages. There is no doubt that the rapid development of artificial intelligence will allow to automate this system and maximise its efficiency. Knowing what to expect helps us adapt and prepare for a more resilient future [5].

There are many solutions that can ensure progress in terms of decarbonisation. Today, a particularly popular option for companies is to switch to renewable energy sources. Solar, wind and hydropower have very serious prospects for development and are already allowing companies to significantly reduce greenhouse gas emissions.

An additional advantage is that businesses now have a choice of investing in their own equipment and renewable energy plants or purchasing already generated green energy from specialised companies.

The successful experience of such a policy can be seen in a huge number of countries around the world, both among small business players and global market leaders. Apple, Google, Microsoft, Amazon, Samsung, Tesla are just the beginning of the list of all those companies that already have successful experience in using them in their activities. A modern example of the use of solar panels is excellently demonstrated in Fig. 2.

Figure 2 – The use of solar panels
*Source: https://abcnews.go.com/Technology/apples-headquarters-facilities-now-powered-100-percent-renewable/story?id=54362901*

No less important solution today can be the development of companies' infrastructure and the improvement of the energy efficiency of their operational processes. This includes not only the general use of energy-saving technologies or the modernization of outdated equipment, but also the qualitative optimisation of logistics. A change in the approach to transportation and resource distribution, alteration of delivery routes and minimization of downtimes can significantly improve the current situation.

It is impossible not to mention the use of electric vehicles, which are becoming increasingly widespread in business. Today, this solution is able to provide a long list of significant advantages compared to vehicles with a regular internal combustion engine. A modern example of the use of electric transport can be seen in Fig. 3.


Figure 3 – The use of electric transport by FedEx company
*Source: https://newsroom.fedex.com/newsroom/global/fedex-continues-advancing-fleet-electrification-goals-with-latest-150-electric-vehicle-delivery-from-brightdrop*

One of the most modern options currently being considered by business companies is the implementation of a wide range of reverse logistics practices and the development of a circular economy. This model can create a closed production cycle and increase the efficiency of business processes, when waste from one operation can not only become a resource for others, but also be reused or safely utilised. In this context, a good example would be «Dell Reconnect». This is a modern residential computer recycling program. A scheme of its functioning can be seen in Fig. 4.


Figure 4 – Scheme of the «Dell Reconnect» program functioning
*Source: https://www.goodwillsouthernaz.org/recycle/recycling-computers-with-dell-reconnect/*

Despite the fact that it is not easy to implement such a system, it can greatly improve resource efficiency, reduce greenhouse gas emissions and improve the overall environmental friendliness of the particular business.

When a company organises a plan for successful decarbonisation, it is crucial to not neglect the importance of involving the working staff, its own suppliers, business partners and other institutions in these processes, as they play a key role in them. Decarbonisation has become a global imperative and a priority for governments, companies and society at large, because it plays a very important role in limiting global warming [6].

It is necessary to form and support a new, unified corporate culture that gives a clear understanding of why it is essential to move in the direction of environmental initiatives. This can be achieved through informational and educational activities, various courses, environmental events, conferences, trainings, audits, forums, etc. A very good modern example can be ADIPEC 2023, which is shown in Figure 5.


Figure 5 – ADIPEC 2023
*Source: https://www.khaleejtimes.com/business/adipec-2023-a-success-showing-global-energy-industrys-commitment-to-decarbonization*

It was another suggestion that we should introduce Information Technology (IT) based practices a either the management information system (MIS) or the enterprise resource planning (ERP) or technology deployment initiative in order to reduce inventory adjustment time (IAT). As soon as the discrepancy in inventory is observed, with the fastest means of communication real time information is immediately sent to administration team to hire the workers. The objective is to adjust the inventory discrepancy in the least time frame through faster information flow system. But simulation results tell the different story; value of IAT = 1 days as compared to 5 days increases oscillations and vanishes system's stability. This policy is based on parametric change.

It is also worth mentioning the current significance of participation in various partnerships and international initiatives. Collaborative projects with other market players and organisations provide companies with the opportunity to exchange precious experience, statistics, information and knowledge, share impressions of new technologies, adjust ideas, create global plans, develop new approaches, standards and practices. The importance of climate change, which is largely due to rising CO2 emissions, has been recognized not only internationally but globally, by all countries committing themselves to sustainable development [7].

Everyone is now well aware of the benefits of such co-operations, especially financial ones. The possibility of gaining significant funds to finance various environmental initiatives motivates more and more people every year. That is why decarbonisation is so important in our time. The article is a logical continuation of a number of publications by the authors devoted to the greening of logistics activities [7-11].

**Conclusions.** The result of this article was the achievement of all the previously set goals. In this work, we have clearly indicated

that today such problems as environmental pollution and climate change are global in scale. We have not only focused attention on their seriousness, but also pointed out that in order to overcome these problems, or at least slow down their pace, humanity needs to make a truly comprehensive effort. We not only explained that in our time, the issue of ecological preservation is extremely relevant, but also emphasised that the problems connected with environmental pollution and climate change are long-term challenges for humanity. Their gradual worsening has led to the search for new ideas and decisions that can correct the situation, one of which was the decarbonisation of companies' activities. We explained the idea of decarbonisation, revealed possible definitions of this term and highlighted its modern importance. Attention was paid to the necessity of creating a decarbonisation plan and monitoring its execution. We pointed out that the implementation of this idea is realistic but very complex. This paper qualitatively outlined the key ways that can be used to achieve success in decarbonisation and indicated the key advantages that can be gained from it. Summing up all the information above, the conclusion becomes quite obvious. Today, decarbonisation has an enormous importance for modern companies. It demands comprehensive and well thought out actions from them. Of course, such measures are not easy, but they are undoubtedly necessary to improve the environmental friendliness of the business segment. Decarbonisation needs a comprehensive approach, as it can be effectively achieved in many ways. All solutions presented in this paper are only a small part of the huge list of possible options for achieving decarbonisation. Proper implementation of these ideas will not only help companies reduce their greenhouse gas emissions, but will also open up new opportunities for them, improve their image and market competitiveness. The issue of decarbonisation of companies' activities is crucial, and that is why it is so important to continue to research, study and analyse it in a high-quality manner.

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