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POSSIBLE WAYS OF THE SUSTAINABLE DEVELOPMENT CONCEPT REALISATION BY LOGISTICS COMPANIES, THE NECESSITY OF USING «GREEN» TECHNOLOGIES FOR DECARBONISATION OF THEIR BUSINESS ACTIVITY

Vladyslav Marchenko, Dmytro Bugayko. *«Possible ways of the sustainable development concept realisation by logistics companies, the necessity of using «green» technologies for decarbonisation of their business activity». Nowadays, more and more people are becoming seriously concerned about the problems of gradual environmental pollution and climate change. Over the past decades, they have become truly complex and global in scope. The long-term policy of ignoring these extremely important questions in the past has led to a staggering number of negative consequences that we are now seeing in all countries of the world. Today, it is no longer possible to continue to pretend that our activities have absolutely no impact on them. That is why, humanity is in constant search of new ideas that will be able to solve these problems, or at least slow down their pace. One of such, the most effective and promising examples was the creation of the extremely important concept of sustainable development. It has a very essential role in the spheres of logistics and management. Nowadays, all our activities in one way or another rely on them. In the global economy, the logistics sector is a major force that stimulates efficient trade and ensures the movement of goods. The logistics sphere works with a giant number of elements, various corporations, enterprises, companies, all possible transport vehicles and people. It connects them into a truly colossal in size and unified network. But it is always worth remembering that it has a huge impact on the above-mentioned problems. Currently, one of the key goals is to minimise the negative impact of logistics on the environment. That is why it is important to move this system in the direction of sustainable development, implementation of «green» initiatives, projects and technologies. In our time, the question of decarbonisation of logistics companies' activities is really important and highly relevant, and therefore researchers should continue to monitor, study and analyse the prospects for the development of the logistics sector in this direction.*

Keywords: sustainability, ecology, decarbonization, optimization, development, prospects, efficiency, transport, business, technologies

Владислав Марченко, Дмитро Бугайко. «Можливі шляхи реалізації концепції сталого розвитку логістичними компаніями, необхідність використання «зелених» технологій задля декарбонізації їх бізнес-діяльності». У наш час, все більше і більше людей починають серйозно перейматися проблемами поступового забруднення навколишнього середовища та зміни клімату. За останні десятиліття вони стали по-справжньому комплексними та глобальними за масштабом. Довготривала політика ігнорування цих надзвичайно важливих питань у минулому призвела до приголомшливої кількості негативних наслідків, які ми зараз спостерігаємо в усіх країнах світу. Сьогодні, більше неможливо продовжувати робити вигляд, що наша діяльність не має абсолютно жодного впливу на них. Саме тому, людство перебуває в постійному пошуку нових ідей, які зможуть вирішити ці проблеми, або принаймні сповільнити їх темпи. Одним з таких, найбільш ефективних та перспективних прикладів стало створення неймовірно важливої концепції сталого розвитку. Вона має дуже суттєву роль у сферах логістики та менеджменту. Сьогодні вся наша діяльність так чи інакше спирається на них. У глобальній економіці логістичний сектор є головною силою, що стимулює ефективну торгівлю та забезпечує переміщення товарів. Сфера логістики працює з гігантською кількістю елементів, різноманітними корпораціями, підприємствами, компаніями, усіма можливими транспортними засобами та людьми. Вона об'єднує їх у справді колосальну за розмірами та єдину мережу. Але завжди варто пам'ятати, що вона має величезний вплив на вищезгадані проблеми. Наразі однією з ключових цілей є мінімізація негативного впливу логістики на навколишнє середовище. Саме тому важливо рухати цю систему в напрямку сталого розвитку, впровадження «зелених» ініціатив, проєктів та технологій. В наш час, питання декарбонізації діяльності логістичних компаній є дійсно важливим і характеризується високою актуальністю, а тому дослідники повинні продовжувати відслідковувати, вивчати та аналізувати перспективи розвитку логістичної сфери в цьому напрямку.

Ключові слова: сталість, екологія, декарбонізація, оптимізація, розвиток, перспективи, ефективність, транспорт, бізнес, технології

Introduction. At present, we can clearly see that the consequences caused by the environmental pollution and climate change are becoming very serious and global in scale. That is why more and more people are becoming interested in sustainable development, which represents a new, effective concept that is aimed at counteracting these processes and has extremely high prospects. The growing attention to this direction qualitatively stimulates the search of possible variants of its improvement in different spheres of our life. Today, this concept represents a new, powerful comprehensive philosophy of our civilisation's development. It is rapidly gaining great popularity in the modern market, as it is based on the idea of achieving an optimal

balance between economic, social and environmental aspects. It relies on innovative solutions, green technologies, advanced scientific achievements, reforms, environmental awareness of people and modern technical solutions. Its high-quality implementation in different spheres of our life can really improve the situation with the above-mentioned problems. The task of implementing this concept in the areas of logistics and management is still a priority and is of great importance to all of humanity. Finding effective solutions that can minimize the level of harmful emissions into the atmosphere is particularly important. It is still on the agenda of world leaders and international organizations. The decarbonization of logistics activity has

become a critical issue. That is why it is so important today to continue to analyse and explore different ways to achieve these goals.

The purpose of the article is to research possible ways of implementing the concept of sustainable development on the example of «Nova Poshta» company and to explain the importance of decarbonizing the business activities of logistics companies. In this article, the «Nova Poshta» company will be researched, its activity in the direction of sustainable development will be analyzed, and the importance of the decarbonization of logistics companies' business activities will be explained. Based on the results of the conducted research, a conclusion will be formulated.

Presentation of the main results. The modern logistics sphere strives for qualitative changes and innovative ideas, especially in the field of sustainable development. Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs [1]. In our time, the level of market competition has reached such a high level that the practice of planning a few steps in advance is no longer enough. Real success will be achieved by those players who have a clear vision of their future, carefully think it through, effectively adapt to changes and follow modern tendencies. Today, the logic of an increasing number of people clearly states that if their company does not follow the concept of sustainable development, does not care and does not take real steps to positively resolve the previously mentioned issues of climate change, depletion of natural resources and environmental pollution, it demonstrates its indifference, imperfection and outdatedness, and therefore, they need to look for another representative who is aware of all this and acts appropriately.

«Meest Express», «Ukrposhta» and «Nova Poshta» are the main representatives of the logistics market in Ukraine that have

significant prospects in the field of sustainable development. These representatives are true leaders that adapt very quickly to new social needs and popular trends. This article will analyse the activity of the company «Nova Poshta», explore its achievements and prospects in the direction of sustainable development.

Nova Poshta is the largest private operator of postal services in Ukraine and one of the most dynamic and fast-growing companies in the country in general [2]. It operates both in the Ukrainian market and abroad. The company has succeeded by providing good postal services, raising the efficiency of transportation to a completely new level. Even now, not all Ukrainian companies can achieve such effectiveness. The mission of the company is making delivery easy for life and business, to simplify customers' life [3].

«Nova Poshta» is constantly introducing new services and creating attractive logistics offers. The company aims to meet all the highest international quality standards. To achieve this goal, it analyses and borrows the best international experience and practices. «Nova Poshta» is a good example of a modern logistics company that constantly strives for development and self-improvement. Its great effectiveness can be clearly seen on the example of its key operational quality indicators in Table 1.

Continuous improvement of services and work with clients, which the company carries out on a regular basis, has allowed it to achieve success and a good position in the market.

«Nova Poshta» is working to develop a really wide, modern network of automated parcel terminals. The company wants to increase its own level of operational efficiency in parcel processing by using modern sorting infrastructure, powerful equipment and different robotic systems.

Table 1. «Nova Poshta» key operational quality indicators as of 05.01.2024

№	Operational quality indicators	%
1	On time to the branch	98,54%
2	On time to the door	91,68%
3	Cargo collected on time	97%
4	Net Promoter Score	76%

Source: Developed by Vladyslav Marchenko&Dmytro Bugayko

The company's best sorting infrastructure is located in big cities, such as Kharkiv, Lviv,

Khmelnytskyi, Dnipro or Kyiv, which is well demonstrated in Fig. 1.



Figure 1 – «Nova Poshta» Kyiv Innovative Terminal

Source: <https://mc.today/shhodnya-tut-rozpodilyayut-283-tis-posilok-yak-pratsyuye-najbilshij-kiyivskij-terminal-novoyi-poshti/>

The company has efficient Innovative terminals with high sorting line capacity, which can be seen in Fig. 2.

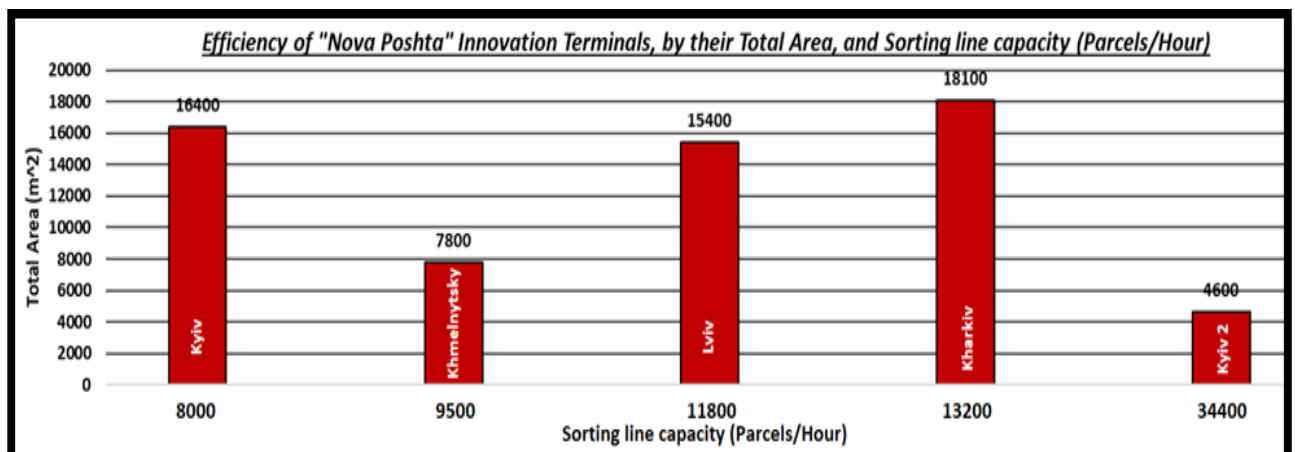


Figure 2 – Efficiency of «Nova Posta» Innovation Terminals

Source: Developed by Vladyslav Marchenko

Having analysed the company's reports, we can see that today, «Nova Poshta» is one of

the largest taxpayers to the Ukrainian budget. Its taxes in recent years can be seen in Fig. 3.

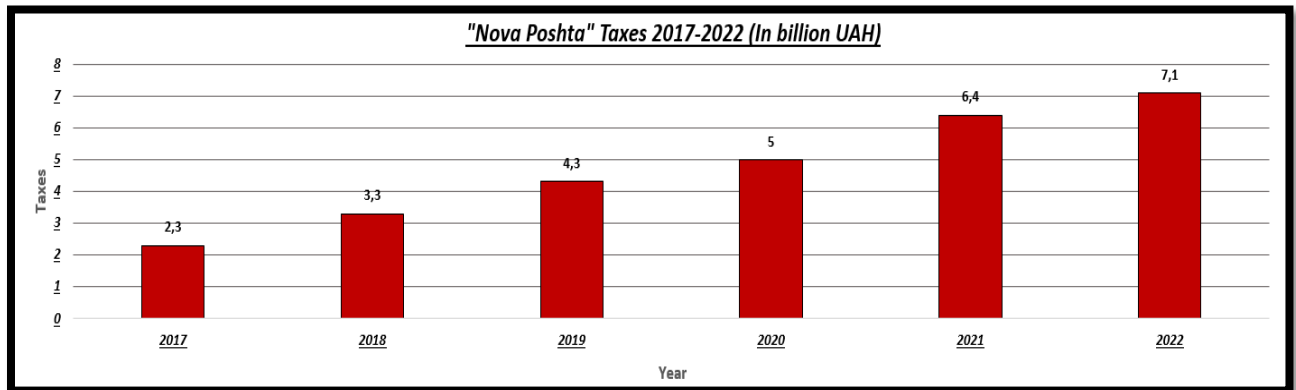


Figure 3 – «Nova Poshta» taxes in 2017-2022

Source: Developed by Vladyslav Marchenko

«Nova Poshta» has a flexible, well-thought-out strategy that gives its business divisions significant operational freedom in executing processes. This policy allows it to be very dynamic and provide customers with a good range of relevant business services. To conduct a qualitative assessment of a company, it is important to check its key results and performance indicators.

In Ukraine, the company holds a leading position in the field of express delivery. The number of «Nova Poshta» delivery points has grown significantly in recent years. In 2021, it delivered more than 370 million parcels and cargoes. The number of the company's shipments in 2017-2021 can be seen in Fig. 4.

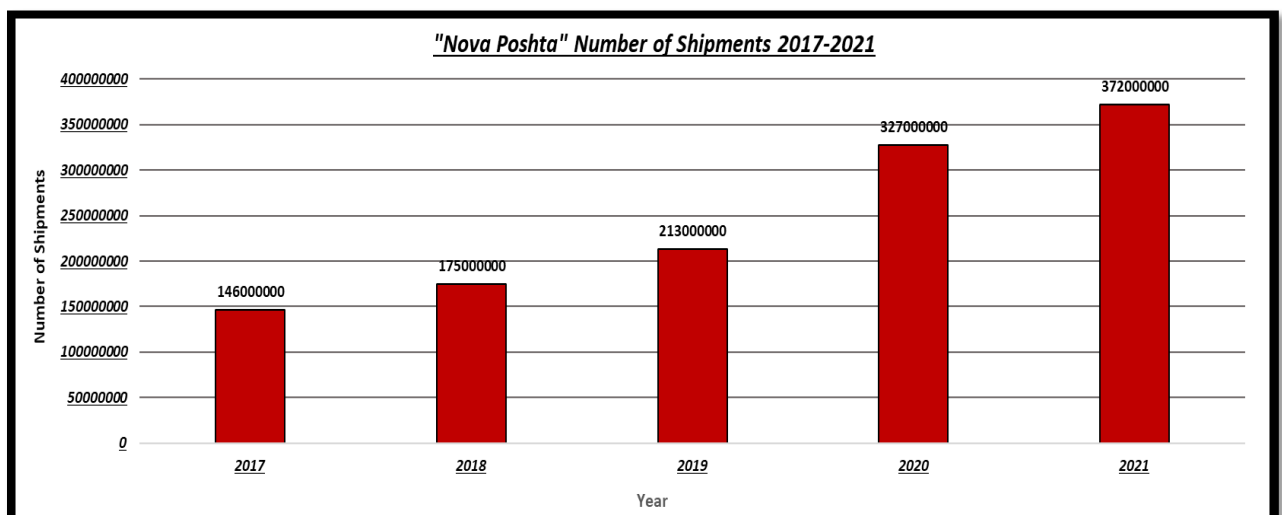


Figure 4 – «Nova Poshta» number of shipments in 2017-2021

Source: Developed by Vladyslav Marchenko

In order to better understand «Nova Poshta» efficiency, its key income indicators for recent years could be presented in a

convenient form of a column diagram in Fig. 5.

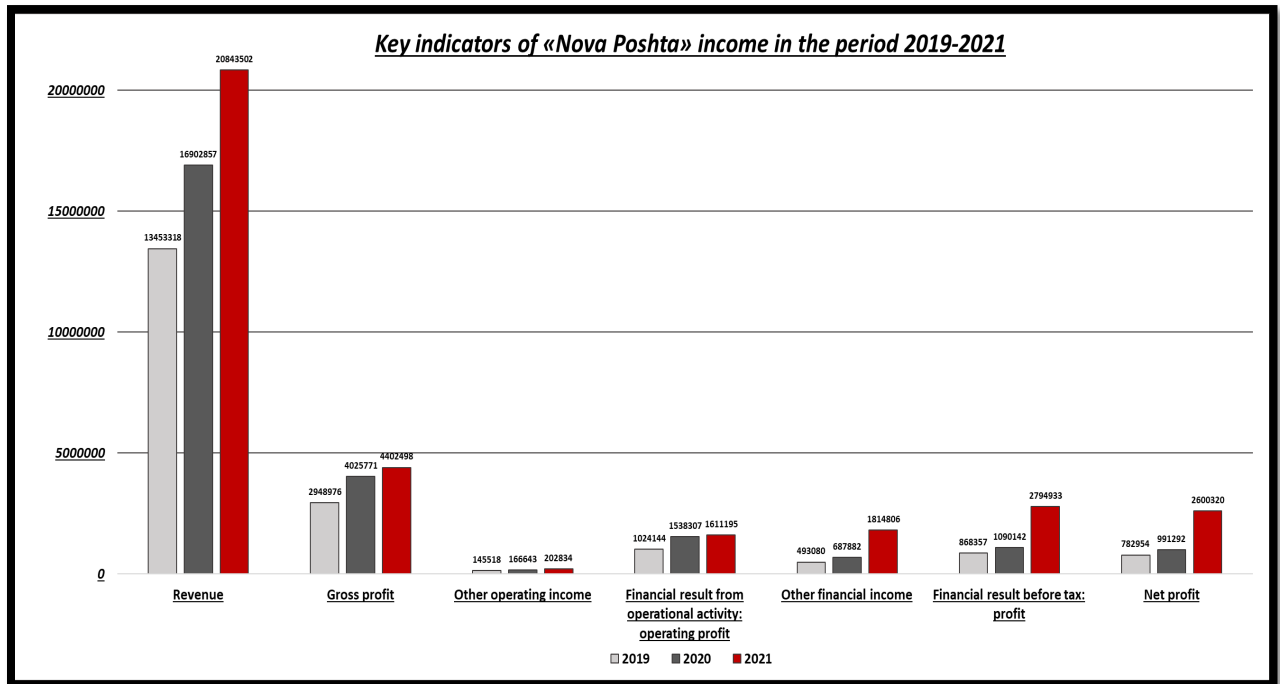


Figure 5 – Key indicators of «Nova Poshta» income in the period 2019-2021

Source: Developed by Vladyslav Marchenko

We can clearly see that all of the above indicators showed growth during this period, which of course demonstrates success, but some parameters had an average increase. No less interesting situation occurred with the

change of costs at «Nova Poshta». Similarly, to the previous case, the key cost indicators can be presented in the form of a column diagram in Fig. 6.

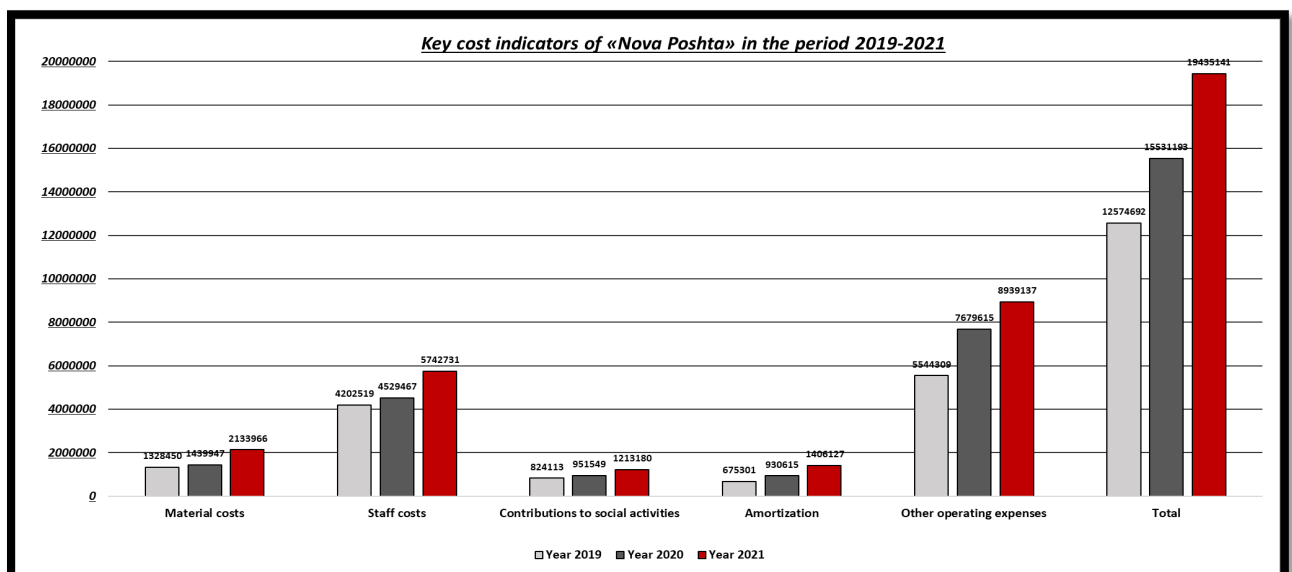


Figure 6 – Key cost indicators of «Nova Poshta» in the period 2019-2021

Source: Developed by Vladyslav Marchenko

The results demonstrate that «Nova Poshta» costs have also increased over these years. The main share of the company's expenses is represented by staff costs and other operating expenses. Of course, this was first and foremost due to the opening of a large number of new branches, a rapid increase in the number of shipments and services. The «COVID-19» pandemic also had a significant impact on this process.

An important practical step that will give us the opportunity to better understand this company and realise its major prospects, features and opportunities will be a SWOT analysis. Although this analysis is relatively simple, it is essential, as it allows us to compare the company's weaknesses and strengths, find opportunities for its future development and identify the main threats to the company. SWOT analysis of «Nova Poshta» company is presented in the Fig. 7.

		Positive	Negative
Internal	STRENGTHS	<ul style="list-style-type: none"> • A wide range of services; • Very flexible pricing policy; • High quality of services, propositions and business offers; • Extensive work experience, both in Ukraine and on the international market; • Powerful network of branches and warehouses. 	<ul style="list-style-type: none"> • Quite high prices for some services of the company; • Insufficiently complex marketing activity; • High workload for employees in some job positions; • Many employees do not have work experience; • Very simple «green» development strategy.
	EXTERNAL OPPORTUNITIES	<ul style="list-style-type: none"> • Innovations and robotics; • e-Commerce development; • Artificial intelligence; • Digitization; • Entering the markets of other neighboring countries; 	THREATS
External			<ul style="list-style-type: none"> • Strong market players in Ukraine; • Aggravation of the economic, social, political and military situation in the country; • Rising prices for fuel; • Powerful competitors on the international market in other countries; • Complication of customs procedures;

Figure 7 – SWOT analysis of «Nova Poshta»
 Source: Developed by Vladyslav Marchenko & Dmytro Bugayko

Having identified the main parameters of all four categories, we carried out a more detailed research by creating a SWOT analysis matrix in Fig. 8.

The analysis showed that this company was able to succeed in the market by creating a system of reliable and efficient logistics services that focus on the key needs and desires of the people. The company's broad experience and well-thought-out flexible pricing policy allowed it to compete with other Ukrainian market players, quickly adapt

to various changes and develop rapidly. In order to remain highly mobile in this era of advanced technology, «Nova Poshta» must pay attention to its digital transformation and the introduction of modern computer systems. It is necessary not only to expand the company's transport network, but also to continue to comprehensively develop a system of tracking the stages of logistics operations.

External Internal	Internal Strength (S)	Internal Weaknesses (W)
External Opportunities (O)	<p>«SO» Strategy:</p> <ul style="list-style-type: none"> - The introduction of modern Innovations, robotics and artificial intelligence into the company's activities will help it not only to create a large number of new services and offers, but also to bring their quality to a completely new level; - The company's comprehensive digitalization and consolidation of «Nova Poshta» LLC in the e-Commerce segment will allow it to maintain its flexible pricing policy and increase its experience; - The development of a powerful network of branches and warehouses will allow the company not only to increase its global competitiveness, but will also serve as an effective factor when entering the markets of neighboring countries. 	<p>«WO» Strategy:</p> <ul style="list-style-type: none"> - Implementation of ecological innovations will allow «Nova Poshta» LLC to improve its «green» development strategy, and the use of robotics will provide an opportunity to simplify the work process for many employees; - Development in the direction of e-Commerce will allow the company to improve its marketing activities; - The introduction of modern AI into the company's activities and the digitization of many processes will significantly simplify the process of training new employees; - Qualitative consolidation of the company on the international market will make it possible to lower prices for various services in the future.
External Threats (T)	<p>«ST» Strategy:</p> <ul style="list-style-type: none"> - The company should continue to develop its services in various directions, since, with the emergence of a powerful player with new offers, «Nova Poshta» will continue not only to earn profits, but also to optimize the business to new high standards; - Continuation of the formation of a very flexible pricing policy of the company will allow it to quickly adapt to fuel price increases; - Establishing the price-quality principle will allow it to compete with representatives of other countries; - Powerful network of branches and warehouses will allow the company to quickly adapt to complicated customs procedures; - Extensive work experience will allow «Nova Poshta» to cope with various types of challenges. 	<p>«WT» Strategy:</p> <ul style="list-style-type: none"> - The use of the «price-quality» system and constant adaptation to market changes will allow the company to qualitatively increase its competitiveness and recognition among citizens; - The introduction of innovations in the company's activities and the development of an effective training program for employees will allow a quick response to the complications of customs procedures or other problematic periods in the country; - The gradual development of the «green» strategy will allow the company's system to be balanced between different types of energy resources, and the mass introduction of «green» technologies will allow to reduce costs, significantly saving electricity and reducing the cost devoted to expensive fuel during energy crises.

Figure 8 – SWOT analysis matrix of «Nova Poshta» company
 Source: Developed by Vladyslav Marchenko & Dmytro Bugayko

The SWOT analysis of the company performed in this article has confirmed that «Nova Poshta» is a truly powerful representative of the Ukrainian express delivery market, which has great opportunities and prospects. Today, the company has a huge number of serious strengths, while its weaknesses are not critical. In our time, the threat to «Nova Poshta» may be the rapid development of its competitors or the emergence of other powerful players in the market that will be able to take the company's share of customers. For this reason, «Nova Poshta» needs to constantly take care of its progress and comprehensive improvement. There is no doubt that the company needs to continue to work hard to implement the concept of sustainable development step by step in its business activities. Today, sustainability

should be an integral part of developing corporate strategy [4].

And that is why this company sees incredible undiscovered potential in achieving sustainable development goals. «Nova Poshta» wants to implement both its own ideas and projects in this area and cooperate with other international companies and organisations.

More and more companies are now turning their attention to «green» development, as in case of its proper realization, it can not only help solve the above mentioned global problems, but also increase their income, improve their image and attract new customers. The implementation of such «green» initiatives and projects is widely supported by various investors and sponsors today.

«Nova Poshta» clearly understands its role, place and responsibility in this system

and is ready to move in this direction. The company aims to take various important steps to minimise the negative impact of its business activities.

«Nova Poshta» spends a lot of effort to remain a modern company with a good reputation. This makes it attractive to investors, shareholders, partners and customers. It tries to fully satisfy everyone, both ordinary citizens and other business representatives. The company wants each of its employees to be able to show their positive skills and strong sides, to fully realise their undiscovered potential. «Nova Poshta» is working to improve the image of Ukraine, representing our country around the world. Its movement towards sustainable development can set a positive example for other business representatives in terms of how to conduct their activities.

«Nova Poshta» has studied in detail the Sustainable Development Goals adopted at the UN Summit in 2015. That is why it is creating an effective management system

which is based on a balance of environmental, economic and social aspects. The responsibility for realization of the concept of sustainable development in the company lies on its employees and administration. They develop relevant plans and formulate the company's policy. The company's heads and department directors closely monitor the implementation of the provisions and principles of sustainable development in its operations.

«Nova Poshta» always tries to integrate the key aspects of the sustainability concept in the most thoughtful way, qualitatively implementing them in its processes. In the future, the company wants to achieve all seventeen goals. Despite the fact that it will not be easy, it is already possible to note that today, thanks to its work, the company has managed to achieve a significant number of them. Sustainable development goals achieved in «Nova Poshta» projects can be seen in Fig. 9.

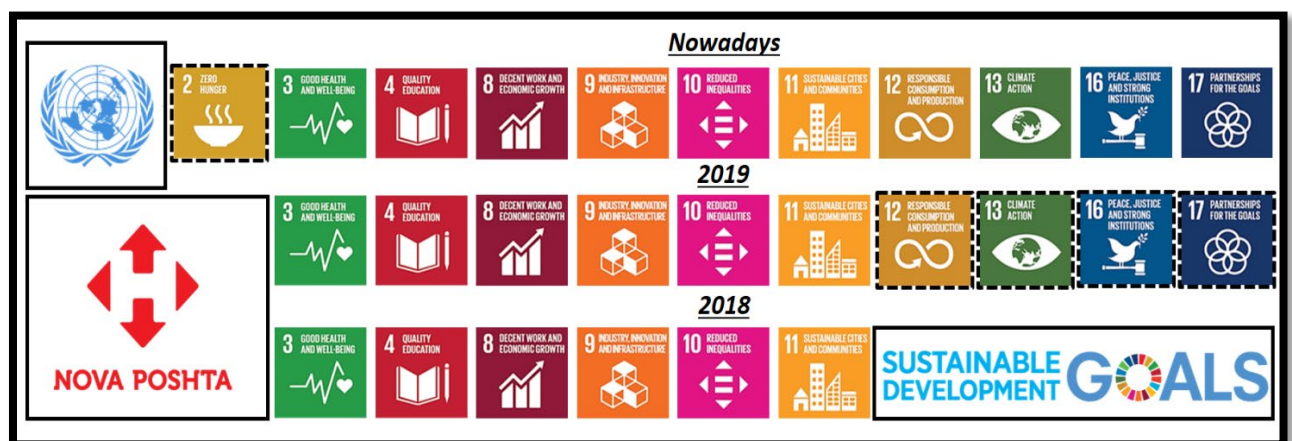


Figure 9 – Sustainable development goals achieved in «Nova Poshta» projects
Source: Developed by Vladyslav Marchenko

A more detailed analysis of the company's activities in this sphere shows that it: «Goal 2» - implemented a big project to deliver food packages to the elderly during the «COVID-19» pandemic; «Goal 3» - uses a health insurance programme for its employees and was one of the first to help medical institutions during the pandemic; «Goal 4» - works to raise the level of education

of its employees and has developed many relevant projects; Goal 8 - cares about its employees, creates and improves working conditions for them; «Goal 9» - invests a lot of money in improving its infrastructure; «Goal 10» - cares about the code of corporate ethics, promotes a healthy lifestyle and does not tolerate discrimination; «Goal 11» - increases the accessibility of its services to local

communities and develops them through humanitarian and educational initiatives; «Goal 12» - recycles waste and strives to achieve the most efficient use of resources; «Goal 13» - optimises its operations to minimise greenhouse gas emissions; «Goal 16» - helps to implement humanitarian projects aimed at restoring peaceful life in

Ukraine; «Goal 17» - cooperates with other market players and various government organisations to achieve sustainable development goals. «Nova Poshta» is so effective in this field because of its fundamental practices, which are shown in Fig. 10.

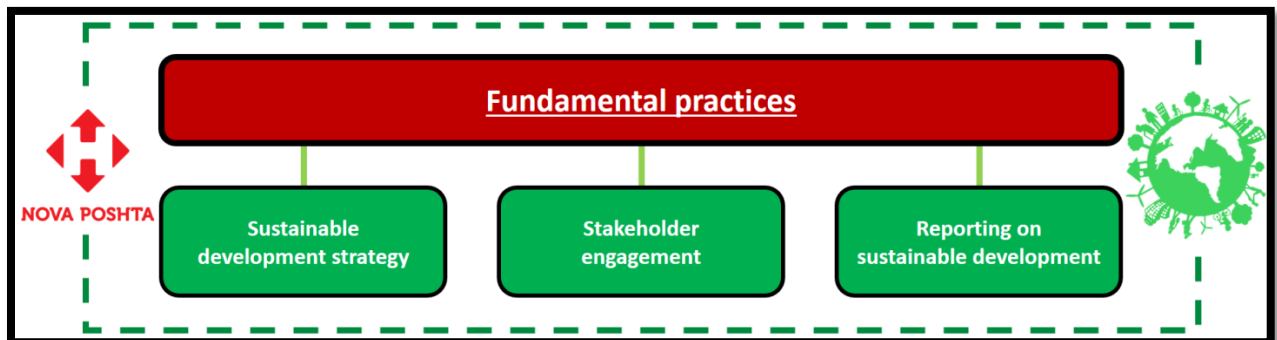


Figure 10 – Fundamental practices of «Nova Poshta» company

Source: Developed by Vladyslav Marchenko&Dmytro Bugayko

In order to write this article, a large number of company reports and various official sources of information were analysed. After reviewing and studying the company's sustainability reports, it was found that «Nova

Poshta» focuses its «green» activity on the following three key areas: Energy saving, 3R principle and CO₂ emissions, which can be seen in Fig. 11.



Figure 11 – The main areas of the company's «green activity»

Source: Developed by Vladyslav Marchenko

In the last years, the company has spent a lot of time implementing a modern electricity accounting system as well as developing a set of energy consumption rules, which is also important. The company's decision to install new LED lamps and replace obsolete lighting

sources with better analogues has enabled it to save resources. And the continuous process of installing modern energy-efficient heaters has enabled the company to cut costs during the heating season.

No less important step was the establishment of the «3R» principle, which is based on the norm: 1. Reduce; 2. Reuse; 3. Recycle.

In the case of «Reduce», the company rejected to use foam and presented a new, modern packaging in the form of a special box-transformer with different height parameters. Equally important was the decision to optimise the boxes, which made it possible to significantly reduce the use of the company's finances and resources. For general «Tube 120» by 4%, and for «Tube 60» by as much as 33%, which is a very good result.

In the case of «Reuse», a positive decision was to launch a promising project aimed at the reuse of different cardboard boxes. This initiative showed great success, as only in the first 2 months from the start of the project, the company managed to reuse 16.5 thousand boxes.

And in the case of «Recycle», a good initiative was the expansion of the project on high-quality installation of recycling containers at the points of delivery, the example of which can be clearly seen in Fig. 12.



Figure 12 – Example of company's recycling bins

Source: <https://rubryka.com/2020/01/28/np-zbyraye-vtorsyrovynu-u-viddilenyah-diznaly-novi-detali-pro-initsiatyvu/>

According to the company's statistics, a huge number of delivery points from all over the country have taken part in this promising project. As a result, more than 1500 points of delivery have been equipped with them by now, which is undoubtedly an excellent indicator. Moreover, it is important to remember that the company has recently started to install additional units in various sorting centres, which will certainly improve the result even further. Based on the latest available statistics from the company's sustainable development report, in 2020, it collected and sent 278501 kg of polyethylene and 1913403 kg of waste paper for recycling.

This has really shown a certain progress in increasing these indicators.

And the last very important question in the field of ecology that this company really cares about is carbon dioxide emissions into the atmosphere. The decarbonisation of the logistics sector is of critical importance, since for a long period of time it has traditionally been powered by fossil fuels. When they are burned, large amounts of carbon dioxide are released into the atmosphere. This leads to environmental pollution, climate change and air quality deterioration. At present, the importance of decarbonisation is becoming absolutely clear to more and more people. This procedure involves a large number of

important steps: the use of different environmentally friendly energy sources, optimisation and improvement of supply chains, application of «green» technologies, implementation of circular economy principles, etc.

Such a serious evolutionary step requires comprehensive approaches that include new policies, technological advances, and stakeholder engagement. Today, governments around the world have begun to legislate emissions targets and establish carbon pricing mechanisms. Logistics businesses have begun investing in electric vehicles, exploring alternative fuels, optimising their transport networks and improving energy efficiency. Today, customers are interested in products that are produced and transported in a sustainable manner.

Without a comprehensive effort to decarbonise logistics, humanity risks facing a climate crisis, severe regulatory pressure and an erosion of public confidence in terms of finding a balance between environmental protection and fast industrial progress. The logistics sphere must continue its course

towards decarbonisation, which will be achieved through «green» technologies and innovations, awareness of our responsibility and commitment to environmental protection.

The worsening of the situation with environmental pollution is connected with the irrational use of resources and the unwillingness of various enterprises to adjust their complex operational activities in accordance with new, modern environmental tendencies. Environmental pollution is a global threat to all of humanity. At present, the logistics sector has a huge effect on the environment, and therefore it is important to find effective ways to minimise this impact. The core advantage of «green» logistics direction development today is that it is based on the most reliable, safe and efficient technological processes.

«Nova Poshta» optimising delivery routes, using higher European fuel standards, and replacing outdated vehicles with more efficient models. In 2020, out of more than 5800 transport vehicles, only 25% had «Euro 3» or lower standard, which can be seen in Fig. 13.

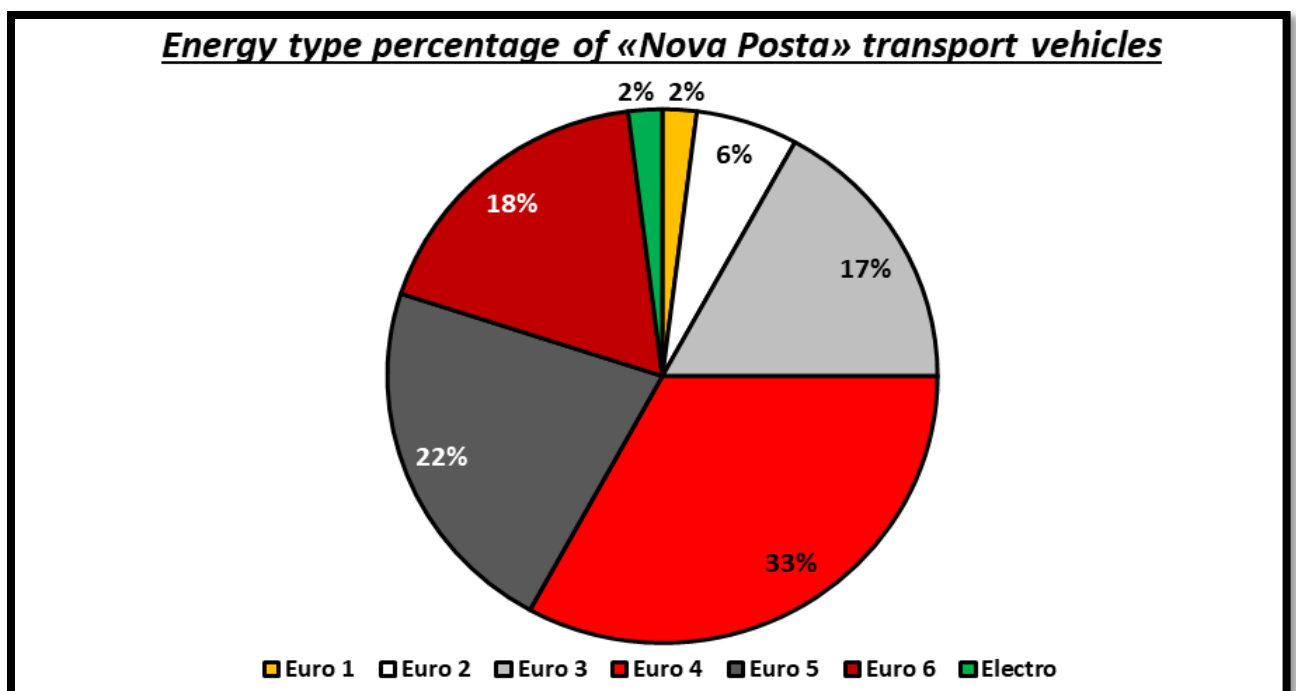


Figure 13 – Energy type percentage of «Nova Poshta» transport vehicles

Source: Developed by Vladyslav Marchenko

In this article, special attention was placed on demonstrating the importance of transport vehicles electrification, as this decision can significantly reduce carbon dioxide emissions. This paper is especially focused on this direction because, according

to the company's reports, only 2% of all its vehicles are electric, and these are not some big trucks that could deliver a large amount of cargo, but mostly ordinary electric scooters, which can be seen in Fig. 14.

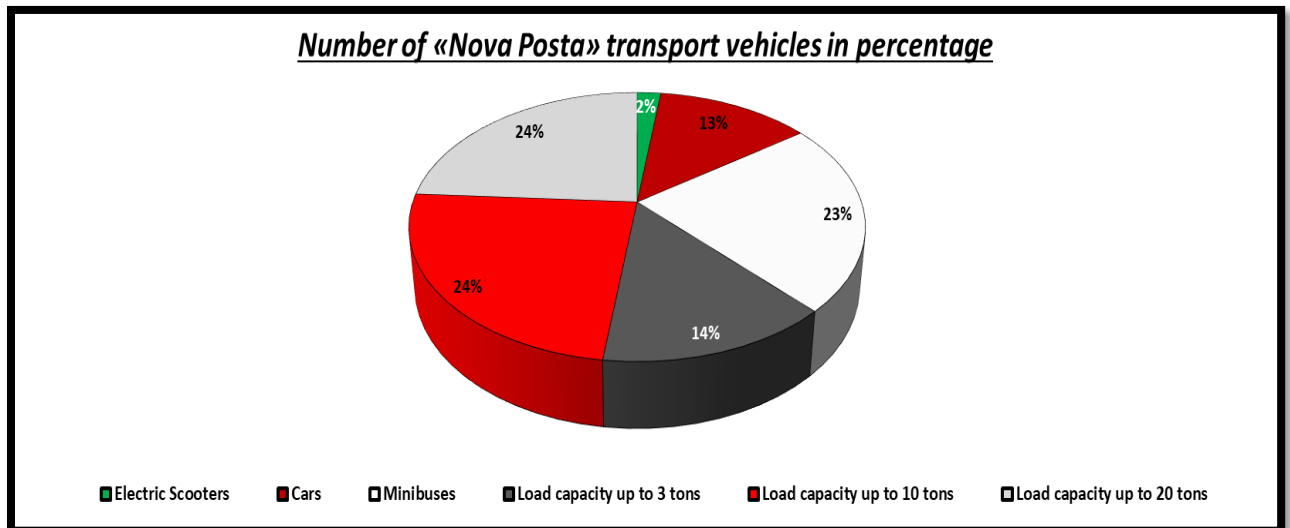


Figure 14 – Number of «Nova Posta» transport vehicles in percentage

Source: Developed by Vladyslav Marchenko

For logistics companies in Ukraine, the use of renewable energy sources, and especially the creation of strategic plans for the electrification of transport vehicles, is of great importance. The modern business strategy of the company should be supplemented by a plan of more intensive replacement of obsolete vehicles with new, more effective electric models. This path will not be easy. Taking into account the current situation in the country, it would be better to start with a special transitional phase - when the company will try to start moving in this direction, with the purchase of more efficient vehicles and the use of hybrid models, and then finally start to fully switch to electric transport. A great benefit is that today, «Nova Poshta» can easily obtain a lot of valuable information, recommendations and experience from such well-known international giants as «FedEx», «DHL» or «Amazon». They have already succeeded in implementing such initiatives and are planning many new projects, especially

«Amazon», which can be clearly seen in Fig. 15.

There are different efficient solutions that can make a company more sustainable. Some of the main examples are: the use of various «green» technologies; development of transport infrastructure; application of innovative ecological solutions; optimisation of the transport network; global development of multimodal transport; optimisation of traffic flows; replacement of obsolete vehicles with new powerful analogues; purchase of modern electric vehicles.

The last example is especially important, as it has great prospects. In our time, this option is gaining more and more popularity. The policy of gradual replacement of obsolete vehicles with modern, ecological models represents one of the most effective and practical ways in terms of «green» development of logistics companies. This process is not fast and simple, as it involves the application of new technological solutions and a significant re-equipment of different systems to modern innovative

models. Despite its complexity, many companies around the world have already begun to implement it, as they see the

«green» course as a new future philosophy of logistics.



Figure 15 – Example of «Amazon» electric transport initiative

Source: <https://autogeek.com.ua/amazon-pochynaie-ekspluatatsiiu-odrazu-300-elektrychnykh-furhoniv-rivian-u-yevropi/>

When implementing the idea of replacing the company's obsolete transport vehicles with new electric analogues, key examples of the benefits for «Nova Poshta» include: significant reduction in fuel costs; maximisation of quality, safety and reliability; the possibility of creating new services and offers; minimisation of operating costs; growth in labour productivity; reduction of costs for vehicles maintenance; minimisation of downtime costs; improvement of the company's image both in our market and abroad; creation of a powerful marketing strategy; increasing the environmental friendliness of its vehicles. At the same time, it is important to remember that electric vehicles have not yet reached their full potential. Despite the fact that they have a lot of serious advantages, we must not forget that they also have another side, with a list of drawbacks. If we are talking about their advantages, we can provide a really wide list of examples.

1. Price. Such transport is no longer something rare and expensive, as it was not so long ago. Every year, the number of such vehicles is growing, technologies are improving, and new manufacturers are appearing on the market. Competition

creates availability, good deals and discounts. The situation depends on the specific characteristics and model, but it is changing for the better side.

2. Reduced financial costs for fuel. Using an electric vehicle allows to stop buying expensive fuel on a daily basis and instead use ordinary electricity as a clean source of energy, which is much cheaper and more convenient. Nowadays, we see a new wave of the energy crisis, and that is why electric vehicles are highly relevant.

3. Ease of maintenance. These vehicles are safe, reliable and do not require the same high level of comprehensive maintenance as regular vehicles, as they simply do not have a large number of components and parts that need to be replaced regularly or constantly monitored. In addition, they do not require as much financial investment as ordinary transport.

4. Low noise level. Unlike very noisy vehicles with an internal combustion engine, electric vehicles are very quiet.

5. Novelty. Society's demand for innovation and the implementation of the green course allows manufacturers to improve these vehicles at a very fast pace, use

various technical solutions, create new models, etc.

6. Security. The most modern video surveillance systems control access to transport and monitor its condition. Security and anti-theft alarms are installed in electric vehicles. There is simply no such thing as a fuel leak in the event of an accident, which means there is no high risk of fire or explosion. In addition, in case of a severe collision on the road, airbags are deployed in such vehicles to save the driver and passengers. The built-in equipment in the vehicle is standardly programmed to automatically disconnect the battery in order to completely stop the vehicle even in such difficult situations.

7. Popularity. Nowadays, electric transport is a new vector of vehicle development, which is considered by society as a new effective and fashionable solution. A huge number of world stars, singers, actors and other people buy them in order to be in the trend of events and stand out from the crowd, showing that they are part of modern society and keep up with the times.

8. Environmental friendliness. Electric vehicles do not have an internal combustion engine but are powered by a battery. Their activity is characterised by the absence of exhaust emissions, and this aspect is very important for environmental protection.

When considering the disadvantages of electric vehicles, a number of quite obvious drawbacks can be identified.

1. The battery. Despite the fact that the situation in this area is improving and its characteristics are getting better, we state that electric vehicles still cannot achieve the same high level of operational performance. Although there is progress in this regard, but it is usually related to individual companies and their luxury models.

2. Slow charging. Nowadays, time is a very valuable resource. When using a standard 220V network, the charging process can take several hours. On the other hand, by using specialised, modern stations, it is possible to fully charge the battery in 50 minutes, which

is much better, but in today's realities, it is still a lot.

3. Not cheap batteries. In our time, the popular warranty period provided by the manufacturer usually ranges from five to eight years. It's important to remember about the process of gradual decrease in battery capacity, which happens slowly but still occurs over a certain period of time. Moreover, different experts emphasise the sensitivity of such batteries to temperature, stating that their capacity decreases during cold periods, and that is why owners need to take this factor into account when they are planning some activities. It is important to be aware of personal needs and the mode of vehicle operation. Reduced vehicle performance in the future can force the client to replace the battery with a new one.

4. Insufficient number of charging stations. When in many EU countries their number has increased significantly, in Ukraine these indicators are still very low, and this is a really serious minus. Besides, we should not forget that in most cases these are ordinary, slow charging stations, not fast ones. In small towns or villages, there are usually no specialised charging stations, so the only real way out of this situation in such places remains charging the vehicle from a regular outlet, whether in the office or at home.

5. Limited speed. Currently, in most cases, the maximum speed of electric transport is represented by a range of 80-100 km/h, as this mode of operation saves battery power. That is why it is important to take this factor into account.

6. Limited range. Such transport, depending on the model and configuration, on a single charge can usually drive from one hundred kilometres to two hundred and fifty. Today, it is quite difficult to achieve much greater results.

Thus, thanks to the conducted analysis of the main advantages and disadvantages of electric transport, it can be stated that these vehicles can already bring their owners a great number of benefits. But, at the same time, we should not forget about the

mentioned limitations. Of course, most of these key problems are directly connected with the transitional technological and service period and will definitely be gradually resolved.

Taking into account all these important factors, the company realised that if it wants to maintain its leadership in the express delivery market, it must start preparing for such major changes now.

Today, it represents a very powerful and active company which, over the many years of

its operation, has been able to learn how to adapt very quickly and effectively to any difficulties. For this reason, «Nova Poshta» regularly discusses the great prospects of the «green» course in logistics. A positive signal for such changes is that in recent years we have seen huge investments in decarbonisation technologies, which is shown in Fig. 16.

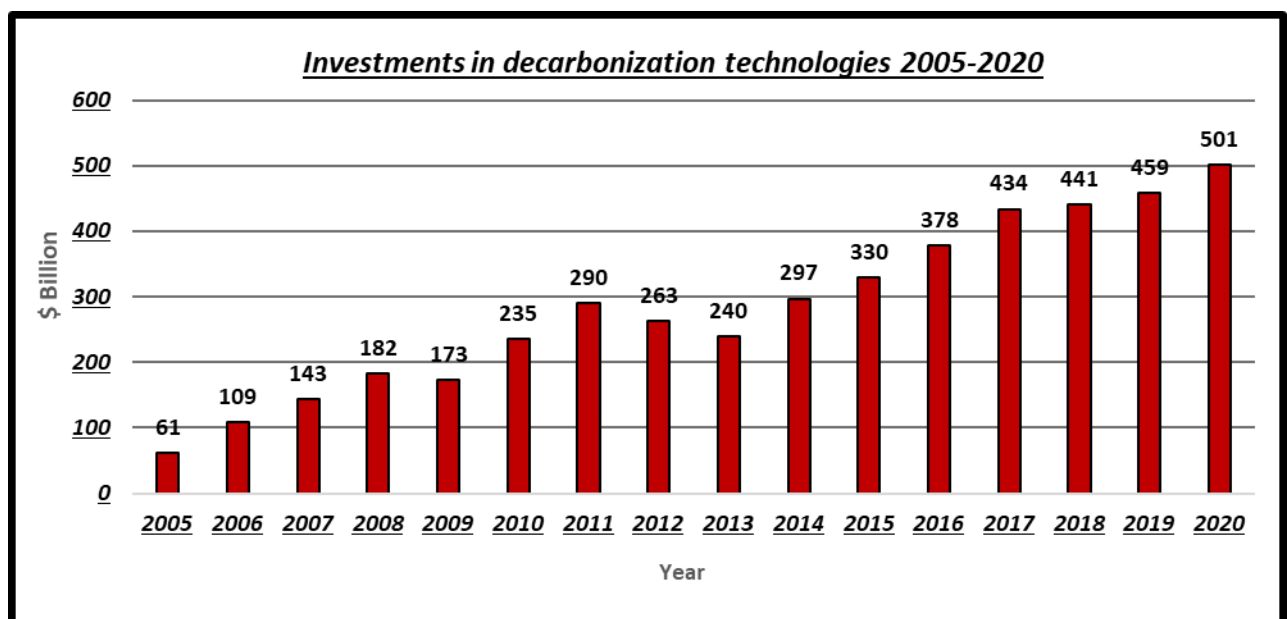


Figure 16 – Investments in decarbonisation technologies in 2005-2020

Source: Developed by Vladyslav Marchenko

Comparing each year with the previous one, it becomes clear that the only moments of decline in the last years were in 2009, 2012 and 2013. The largest share of these investments goes to renewable energy. Moreover, since 2006, the electrification of heat supply has played a much more important role. We can observe a very positive

growth in investment in electric transport starting from 2016 and up to 2020.

Returning to the Ukrainian situation, we can highlight the waves of growth and decline in the level of investments in renewable energy sources, as shown in Fig. 17.

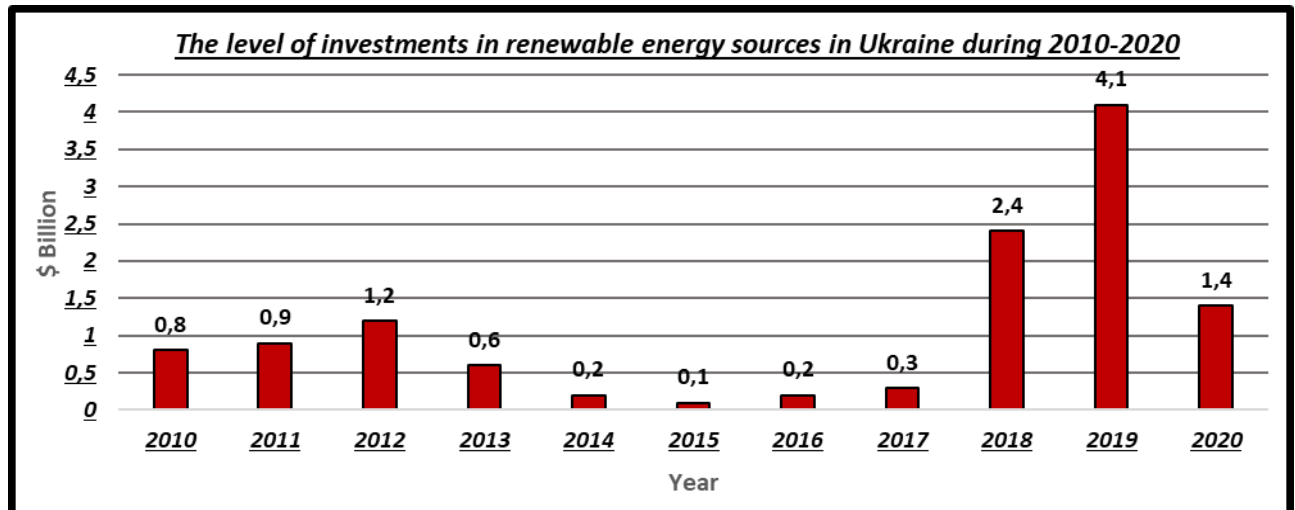


Figure 17 – Investments in renewable energy sources in Ukraine during 2010-2020
 Source: Developed by Vladyslav Marchenko

As we can see, a significant growth in 2010-2012 was followed by a decline in 2013-2015, and the beginning of an improvement in 2016-2019, then fell again in 2020. The question of reducing the level of greenhouse gases in the atmosphere remains a global problem that can only be solved through cooperation. Such a very important attempt was made by the UN Framework Convention

on Climate Change, which was strengthened a few years later by an additional document known as the Kyoto Protocol.

One of the reasons why changes are going slowly can be understood by looking at the system of established taxes. The carbon taxes policy in European countries in 2022 is shown in Fig. 18.

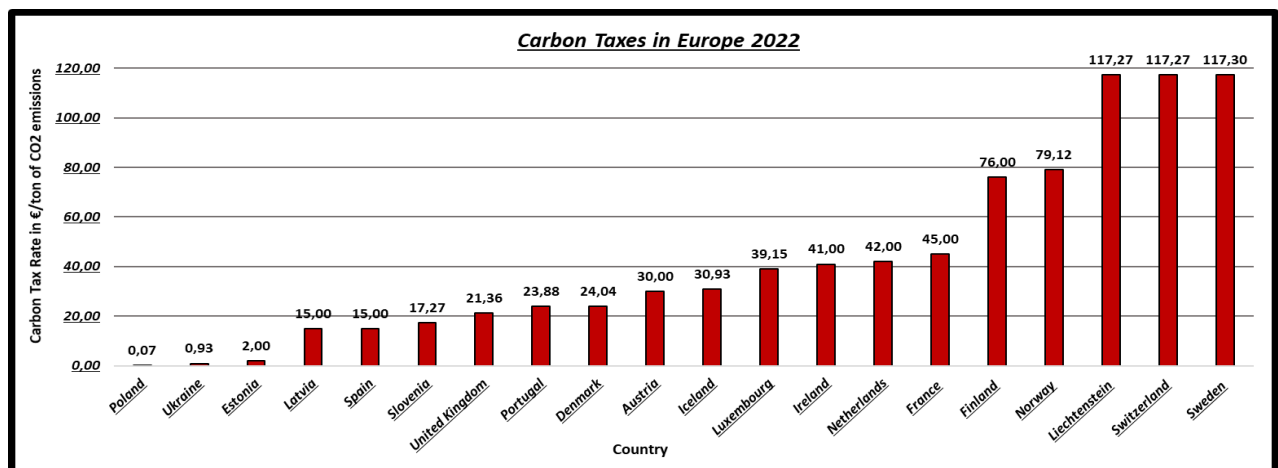


Figure 18 – Carbon taxes in Europe in 2022
 Source: Developed by Vladyslav Marchenko

Based on all the data shown in the figure, it is possible to state that most of these countries have too weak tax policy. It is not able to force businesses to comprehensively move towards the implementation of a «green» course. In order to succeed in this process, countries need to develop a flexible system of transition period, when, on the one

hand, stricter requirements and norms will be set for business, and, on the other hand, positive benefits, assistance, investments, and various grants will be provided. Only such a model will be able to motivate people to act and make real decisions in this field.

It is also important to understand the situation on the market for electric and hybrid

vehicles. Many people are still sceptical about them, but in reality, such transport is incredibly promising. According to available statistics, in 2021, global sales of electric vehicles reached 6.75 million vehicles, which is undoubtedly a great result, as it is more than twice higher than the previous result. If in 2020 the share of electric vehicles (PHEV and BEV) in global car sales was 4.2%, in the next one it increased to 8.3%. It is worth noting that this includes not only ordinary cars or small commercial transport, but also so popular trucks. Analysing this issue in more

detail, it can be pointed out that the percentage of PHEV (29%) in the total sales of electric vehicles is much lower than that of regular BEV (71%). It is also impossible not to mention the negative impact of the «COVID-19» pandemic, during which in 2019 and 2020 the development of this market was slowed down and the initially expected results were not achieved. Only in 2021, when the world gradually recovered and adapted to the new realities, the positive dynamics continued. BEV + PHEV sales (by region) is shown in Fig. 19.

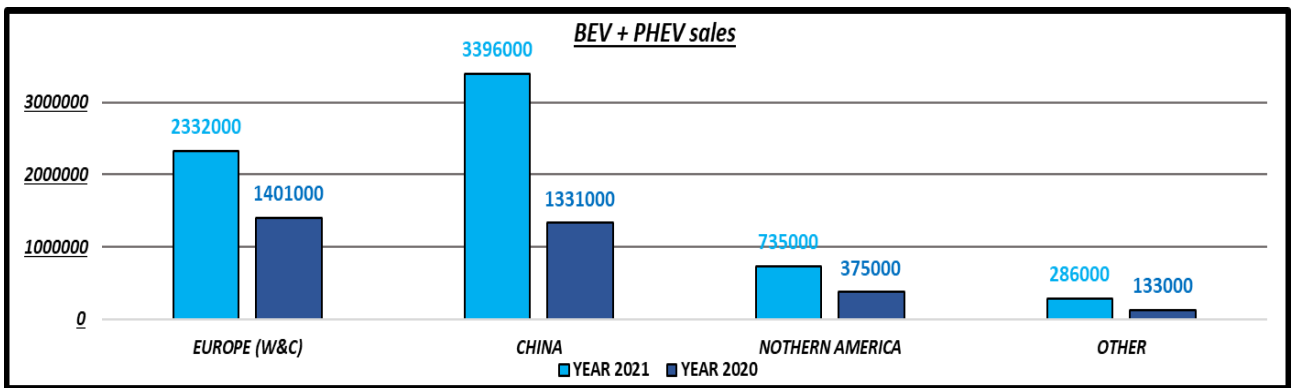


Figure 19 – BEV + PHEV sales (by region)
 Source: Developed by Vladyslav Marchenko

Comparing 2021 and 2020, we can see a sharp increase in China's indicator. If in 2020 the number of sales in it was slightly lower than in Europe, in 2021 its indicator more than

doubled, while Europe increased by 66%. Registration of new EV by region can be seen in Fig. 20.

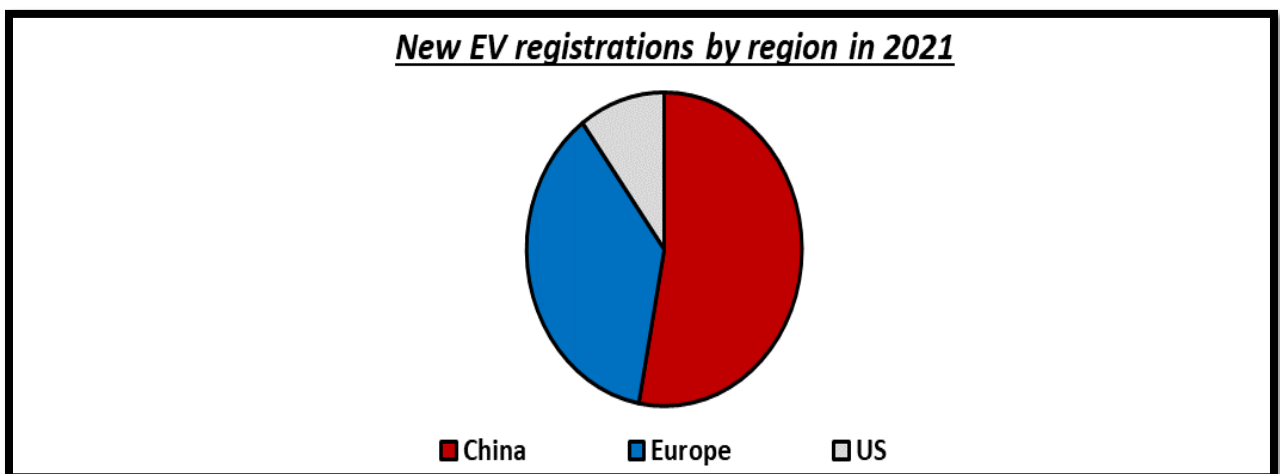


Figure 20 – New EV registrations by region in 2021
 Source: Developed by Vladyslav Marchenko & Dmytro Bugayko

Thus, in 2021, China was in first place with 3.3 million units, Europe was in second place with 2.3 million units, and the US was in third place with 630 thousand units. If we consider

European countries, the leading markets are: Sweden, Norway, Germany and Iceland. Global BEV & PHEV sales and EV market share in 2013-2021 can be seen in Fig. 21.

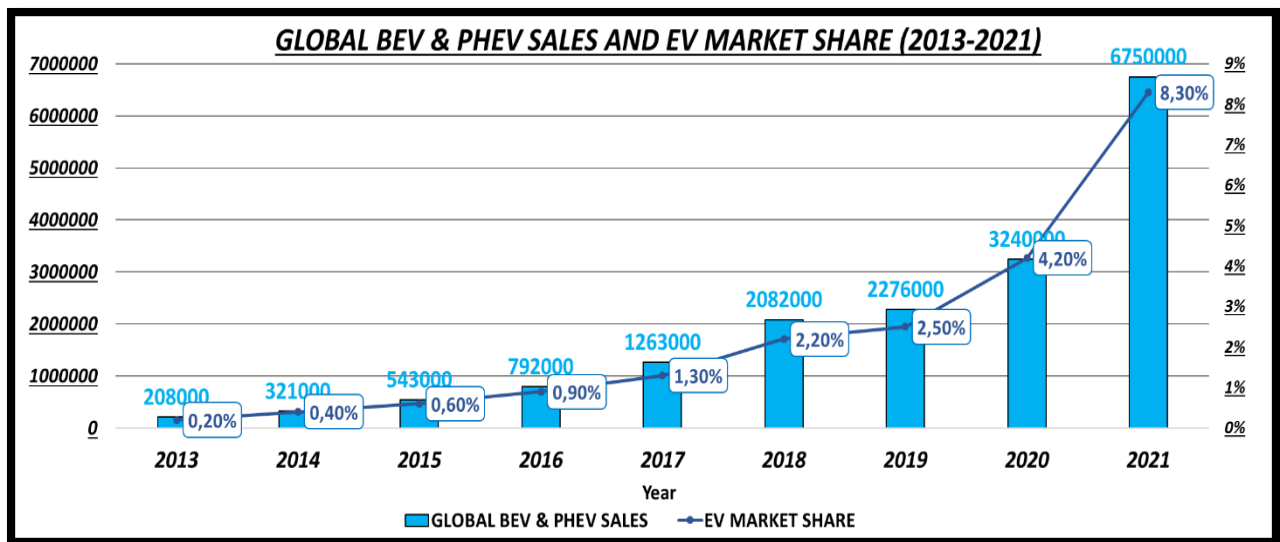


Figure 21 – Global BEV & PHEV sales and EV market share in 2013-2021

Source: Developed by Vladyslav Marchenko

The greatest increase in EV market share compared to the previous year was in 2018, 2020 and 2021. And in the case of global BEV and PHEV sales, it was in 2015, 2018 and 2021.

Based on the information above, it is possible to state that a gradual transition to modern electric vehicles is one of the key decisions needed to achieve the future goal of zero emissions. In order to counteract the global challenges mentioned in this article, companies need to use modern «green» technologies to decarbonise their business activities. The logistics industry has already begun to fully prepare for such serious changes. At the same time, we should not have any illusions that this process will be quick and easy. On the contrary, it will be very difficult. The set goal is absolutely real, but complex. Taking all these things into account, it is clear why sustainable development is so important today. This article is a logical continuation of the authors' publications on sustainable development [5-8].

Conclusions. As a result of the research carried out in this article, all the set tasks have been completed. In this work, we have

explained that such problems as environmental pollution, climate change and depletion of earth's resources are global in scale. In this paper, their seriousness and threat were highlighted. It was pointed out that the long-term policy of ignoring these problems by humanity has only worsened the current situation. In order to overcome these problems, or at least slow down their pace, comprehensive efforts are needed. In this article, the importance of the concept of sustainable development was explained as one of the most promising solutions. Much attention was paid to its realisation in the logistics industry. In this article, the «Nova Poshta» company and its «green» activities were researched in detail. In this work, it was emphasised that this successful company perfectly demonstrates a wide range of possible directions for realisation of the concept of sustainable development in the logistics sphere. Particular attention in this paper was paid to the use of «green» technologies in order to decarbonise the activities of logistics companies. In this article, it was not only explained the importance of

this process, but also paid attention to the high prospects of using electric transport, explained its key advantages and disadvantages. After analysing the situation in this market, positive trends for its future development were noted. In addition, this paper emphasises that Ukrainian companies can borrow significant experience from global leaders that have already succeeded in this area. Special attention was paid to the need to develop a flexible transition system, when, on

the one hand, stricter requirements and norms will be set for business, and, on the other hand, positive benefits, assistance, investments and various grants will be provided. The paper points out that the implementation of this idea is realistic, but complex. As a final result, it was stated that sustainable development is of great importance today and that is why it is very important to continue to research and develop this concept.

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