MINISTRY OF EDUCATION AND SCIENCE OF UKRAINE
NATIONAL AVIATION UNIVERSITY
Faculty of Transport, Management and Logistics
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QUALIFICATION PAPER

(EXPLANATORY NOTES)

OF GRADUATE OF ACADEMIC DEGREE

«BACHELOR»

THEME: **«Planning an environmentally oriented customer service process of a logistics company»**

Speciality 073 «Management»

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I certify that in this qualification paper there are no borrowings from the works of other authors without appropriate references *Tetiana KISERA*
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Kyiv 2024

МІНІСТЕРСТВО ОСВІТИ І НАУКИ УКРАЇНИ
НАЦІОНАЛЬНИЙ АВІАЦІЙНИЙ УНІВЕРСИТЕТ
Факультет транспорту, менеджменту і логістики
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ЗАТВЕРДЖУЮ
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(ПОЯСНЮВАЛЬНА ЗАПИСКА)

ЗДОБУВАЧА ОСВІТНЬОГО СТУПЕНЯ

«БАКАЛАВР»

ТЕМА: **«Планування екологоорієнтованого процесу обслуговування споживачів логістичної компанії»**

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Засвідчую, що у цій кваліфікаційній роботі немає запозичень з праць інших авторів без відповідних посилань *Тетяна КІСЕРА*
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Київ 2024

NATIONAL AVIATION UNIVERSITY
Faculty of Transport, Management and Logistics
Logistics Department

Academic Degree Bachelor

Speciality 073 «Management»

Educational Professional Program «Logistics»

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«13» May 2024

TASK

FOR COMPLETION THE QUALIFICATION PAPER OF GRADUATE

Tetiana Kisera
(name and surname)

1. Theme of the qualification paper: «Planning an environmentally oriented customer service process of a logistics company» was approved by the Rector Directive №624/ст. of April 24, 2024.

2. Term performance of the work: from May 13, 2024 to June 16, 2024.

3. Date of submission paper to graduation department: June 01, 2024.

4. Initial data required for writing the paper: general and statistical information about logistics market in Ukraine, information of the company DSV, production and financial indicators of the company DSV, literary sources on information logistics and internal communication process, Internet source.

5. Content of the explanatory notes: introduction, the essence of the information system; the specifics of information logistics in the modern market; analysis the activity of the company DSV; identification of disadvantages in the internal exchange information; construction the algorithm and improving of the information exchange systems in business process in the company; calculation of the economic effect of the proposed measures; conclusions and appendix.

6. List of obligatory graphic matters: tables, charts, graphs, diagrams illustrating the current state of problems and methods of their solution.

7. Calendar schedule:

№	Assignment	Deadline for completion	Mark on completion
1	2	3	4
1.	Study and analysis of scientific articles, literary sources, normative legal documents, preparation of the first version of the introduction and the theoretical chapter	13.05.24-16.05.24	Done
2.	Collection of statistical data, timing, detection of weaknesses, preparation of the first version of the analytical chapter	17.05.24-20.05.24	Done
3.	Development of project proposals and their organizational and economic substantiation, preparation of the first version of the project chapter and conclusions	21.05.24-26.05.24	Done
4.	Editing the first versions and preparing the final version of the qualification paper, checking by standards inspector	27.05.24-29.05.24	Done
5.	Approval for a work with supervisor, getting of the report of the supervisor, getting internal and external reviews, transcript of academic record	30.05.24-31.05.24	Done
6.	Submission paper to Logistics Department	01.06.24	Done

Graduate_____
(signature)

Supervisor of the qualification paper _____
(signature)

8. Consultants of difference chapters of paper:

Chapter	Consultant (position, surname and name)	Date, signature	
		The task was given	The task was accepted
Chapter 1	Associate Professor, Pozniak O.V.	13.05.24	13.05.24
Chapter 2	Associate Professor, Pozniak O.V.	17.05.24	17.05.24
Chapter 3	Associate Professor, Pozniak O.V.	21.05.24	21.05.24

9. Given date of the task May 13, 2024.

Supervisor of the qualification paper: _____ Oksana POZNIAK
(signature of supervisor) (surname and name)

Task accepted for completion: _____ Tetiana KISERA
(signature of graduate) (surname and name)

ABSTRACT

The explanatory notes to the qualification paper «Planning an environmentally oriented customer service process of a logistics company» comprises of 100 pages, 25 figures, 12 tables, 59 references and 7 appendixes.

KEY WORDS: LOGISTICS, ENVIRONMENTALLY-ORIENTED CUSTOMER SERVICE, POWER-TO-X, LOGISTICS PROCESS PLANNING, ECONOMIC EFFICIENCY

In the theoretical chapter, the methodological principles of planning an ecologically oriented process for improving customer service are thoroughly considered, as well as the global experience of using "green" technologies in customer service processes is summarized.

In the analytical part, a comprehensive analysis of the activities of the logistics company DSV, a diagnosis of the financial condition, the strategy of the company's sustainable development and "green" technologies implemented in the company to provide customer service was carried out.

In the project part, a detailed plan of the integration model of the promising "Power-to-X" technology into the process of customer service at various stages of logistics at the DSV company is proposed. The scientific novelty consists in the development of a holistic integrated methodology for planning ecologically oriented customer service processes of a logistics company using the latest "green" technologies using the example of the "Power-to-X" technology.

Materials of qualification paper are recommended to be used during scientific research, in the educational process and in the practice of specialists of logistics departments.

CONTENTS

NOTATION

DKK - Danish krone;

EBIT - Earnings Before Interest and Taxes;

EBITDA - Earnings Before Interest, Taxes, Depreciation and Amortization;

EMEA - Europe, Middle East, and Africa;

LTIFR - Lost Time Injury Frequency Rate;

M&A - Mergers and Acquisitions;

ROIC - Return on Invested Capital;

NPV - Net Present Value;

PI - Profitability Index;

IRR - Internal Rate of Return;

SWOT - Strengths, Weaknesses, Opportunities, And Threats;

KPIs - Key Performance Indicators.

INTRODUCTION

The manner in which consumers are served is evolving on a daily basis, and they are increasingly interested in the type of service they provide and the manner in which it is delivered. The logistics industry must prioritize the development of environmentally-oriented customer service processes in order to satisfy the current requirements, as customer awareness of the environmental component of the process is on the rise. The environment is significantly impacted by the expansion of logistics operations, which leads to the generation of refuse, air and water pollution, and greenhouse gas emissions. Therefore, it is imperative to prioritize the implementation of ecological principles and technologies in logistics processes, particularly in customer service processes, to guarantee the sustainable development of companies.

Carefully balancing excellent customer service with the ideas of sensible environmental management and minimizing the ecological imprint is necessary when planning an efficient system of environmentally conscious customer service. Leading logistics companies are actively engaged in implementing ambitious programs to reduce their environmental impact and promote decarbonization. Nevertheless, the intricate coordination of ecologically focused procedures, incorporating cutting-edge "green" technologies and considering the entire supply chain and product life cycle, still poses an unresolved query necessitating comprehensive scientific investigation.

Current research in this field primarily centers around specific elements, such as the implementation of alternative fuels, the advancement of electric vehicle infrastructure, or the utilization of renewable energy sources in warehouses. Nevertheless, a comprehensive approach to planning an integrated system of ecologically oriented customer service in logistics is still lacking. This approach should consider the entire supply chain and provide a holistic methodology for effective implementation.

The relevance of the chosen topic lies in the fact that the activity of a logistics company in relation to customer service has a significant negative impact on the

environment, and to ensure the execution of processes in more ecological technologies, the logistics company should give priority to planning the implementation of ecological principles and technologies in logistics processes, in customer service processes.

The study's object is the logistics service planning process for customers of the logistics company DSV, which includes all stages of processing, transportation, and delivery of goods to customers using green technologies.

The subject of the study is a set of theoretical, methodological, and practical aspects of planning ecologically oriented customer service, which is built on the principles of end-to-end planning of the activities of a logistics company.

The purpose of the qualification work is to study the theoretical foundations of planning environmentally oriented customer service processes and to develop practical recommendations for the organization of customer service using "green" technologies for the logistics company DSV with the aim of increasing efficiency, reducing the negative impact on the environment and ensuring the principles of sustainable development.

According to the purpose, the following tasks are defined:

- to investigate the theoretical basics of planning environmentally-oriented customer service processes.;

- to analyze the company profile of LLC «DSV» and the main types of activities;

- to conduct an analysis of the main production and financial indicators of LLC «DSV» for the years 2021 - 2023;

- to provide practical recommendations on determining the main directions and prospects for solving the problem of planning environmentally-oriented customer service processes in logistics company LLC «DSV».

In order to address the tasks assigned in the work, a range of scientific methods were employed, including analysis, synthesis, induction, deduction, modeling, and generalization. Additionally, methods of systematization and comparison were utilized, along with specific research techniques such as SWOT analysis, financial, economic, and statistical analysis, and optimization methods for logistics systems.

The theoretical basis of the work is the scientific works of domestic and foreign scientists in the field of air transport, sustainable development, logistics and supply chain management.

The information base of the study was statistical data, annual reports and sustainability reports, as well as internal information of the DHL company.

The results of the thesis were approved at the international scientific and practical conference, as a result of which the theses of the report were published: «Implementing Green Power-To -X Technology in Logistics Operations». Trajectories of sustainable development of Ukraine and the world: challenges and drivers" on April 26, 2024.

CHAPTER 1
THEORETICAL APPROACH TO PLANNING AN ENVIRONMENTALLY ORIENTED CUSTOMER SERVICE PROCESS OF A LOGISTICS COMPANY

1.1 The essence and features of planning an environmentally oriented customer service process of a logistics company

In the busy field of the logistics industry, finding a balance between customer satisfaction and environmental preservation can seem challenging. However, given the growing relevance of environmental practices across all sectors - coupled with customers who are more informed and demanding than ever before - companies must take decisive steps to integrate green operations into their long-term strategy.

The first step is to plan the customer service process itself, and then to add environmental attributes that build the ideal supply chain for the customer.

Let us analyze the main concepts in more detail for a better understanding of the essence.

As noted in the Cambridge Dictionary, the concepts we need are: a plan is a set of decisions about how to do something in the future, or a method for doing or achieving something, usually involving a series of actions or stages, or something you have arranged to do, and the definition of planning is the activity of thinking about and deciding how you are going to do something [22,23,39].

While the American Planning Association (APA) states that Planning is elected leaders' most effective tool for managing growth, navigating change, and making tough decisions facing communities, like where to invest in transportation, housing, and parks [33].

Powered by community planners' data-driven insights, expertise, and sense of residents' needs, the planning process helps communities define their goals and a path to achieving them.

A plan is a roadmap that helps leaders make informed decisions about what residents - and the local economy - need to thrive [24,37].

Planning is the process of thinking about the activities required to achieve a desired goal. Planning is one of the main functions of management along with organization, motivation and control. This is the process of determining the goals of the organization and ways to achieve them. Planning helps to anticipate future problems and opportunities, identify necessary resources, and coordinate efforts to effectively accomplish assigned tasks.

To determine the level of management responsibility for planning horizons, it is necessary to deep consider planning by hierarchy levels (see Fig.1.1 and Table 1.1). Using a hierarchical structure for planning logistics processes allows a company to optimize its logistics operations and make them more profitable. Companies can determine the most effective solutions for their logistics operations by breaking down the task into parts. Additionally, this framework allows companies to anticipate future needs and create solutions that can be implemented.

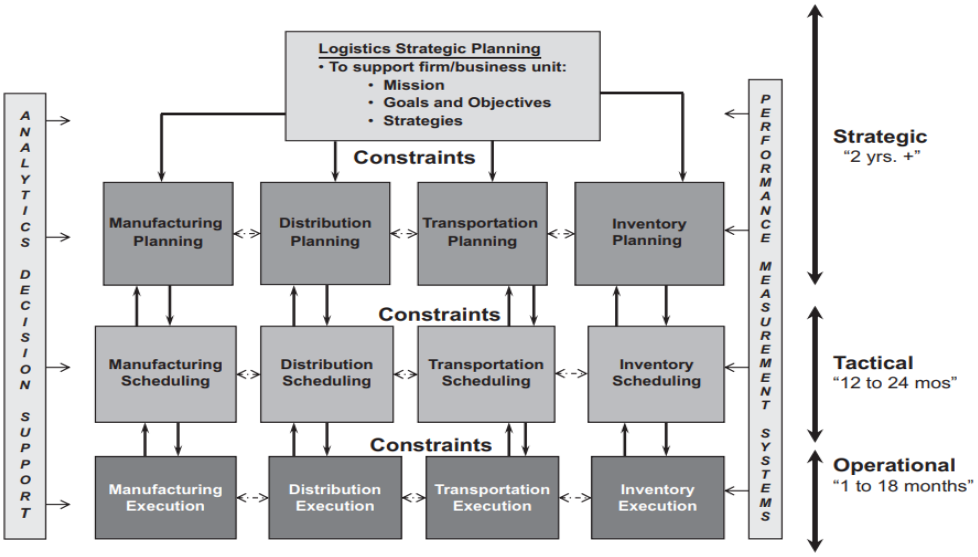


Figure 1.1 – A planning framework of a logistics company [51]

Table 1.1 - Hierarchical framework of planning system [52]

Planning Level	Description	Examples
Strategic Planning	Involves making decisions that have the most significant impact on the organization's long-term success. These decisions often require significant resources and managerial time.	Location and size of a factory, selection of suppliers and vendors, and the development of a global supply chain.
Tactical Planning	Involves making decisions that have a medium-term impact on the organization's success. These decisions require more resources and managerial time than operational planning decisions but less than strategic planning decisions.	Inventory management, transportation schedules, and production scheduling.
Operational Planning	Involves making decisions that have a short-term impact on the organization's success. These decisions require the least amount of resources and managerial time.	Warehouse layout, production line scheduling, and order fulfillment.

In addition, planning can be viewed from a process perspective (see Table 1.2), reflecting the sequence of actions to achieve a goal.

Table 1.2 - Components of the planning process [52]

Process	The function of the process
1	2
Modeling a strategic network	The physical infrastructure of the supply chain is optimized through the selection of acceptable sources of supply, production, warehousing and distribution, which ensures the achievement of the target performance of the supply chain for costs and customer service
Cooperation with consumers	In the course of cooperation with consumers and discussion of the expected demand, an existing proposal creates a mutually agreed sales plan
Sales planning	On the basis of past sales, seasonal indicators and trends, as well as market analysis, a statistical forecast of consumer demand is developed.
Planning requirements for distribution	On the basis of expected consumer demand, which is based on an agreed supply plan, and taking into account the applicable policy on stocks and current and planned levels of stocks at each storage point, plans for moving goods are developed.
Transportation planning	After the development of the plan, the requirements for distribution are transformed into actual volumes of goods transported by sea, air, rail or road transport.
Preparing a full schedule of capacity utilization	An advanced production plan is created at the enterprise level and takes into account the plan of supply, restrictions on capacities and materials available in enterprises, and other factors of the factory-wide level

End of Table 1.2

1	2
Planning for supply based on constraints	The optimal delivery plan is based on expected demand and takes into account all material and capacity constraints as well as other characteristics of the supply chain (production strategy, inventory policy in warehouses, distribution)
Planning materials usage	In order to achieve a balanced flow of materials, the plan of use of materials by time of delivery processes and delivery schedules must be synchronized. The time of delivery of materials and their availability should be based on indicators of the overall plan and its goals
Collaboration with suppliers	On the basis of the achieved interaction with different levels of suppliers, a mutually agreed raw material supply plan is developed.

Table 1.2 presents the role of planning for each company process, but to determine the role of planning in the customer service process, it is necessary to combine the sub processes into one system process and determine the concept of it.

Planning of service processes is a systematic approach to the organization and management of services in the enterprise. It includes determining the best methods, resources and time frames for providing quality services to clients. This may include resource planning, task allocation, quality control, and ensuring service efficiency.

The customer service process of a logistics company is a set of interrelated actions and measures aimed at meeting the needs of customers in transportation, warehousing, inventory management and related logistics services in accordance with agreed requirements and standards.

Here is a flexible framework that can be customized and tailored to the unique needs of the logistics company and the environmentally conscious customer service (see Figure 1.2).

However, achieving harmony between human activity and the natural environment requires a deep understanding of ecological processes and interconnections in the world around us. Ecology is a basic science that studies the complex relationships between living organisms and the environment in which they exist. This field of knowledge helps us understand the delicate balance that exists in

nature and realize the importance of maintaining this harmony for the sustainable development of the planet and companies [11,12,27,28].

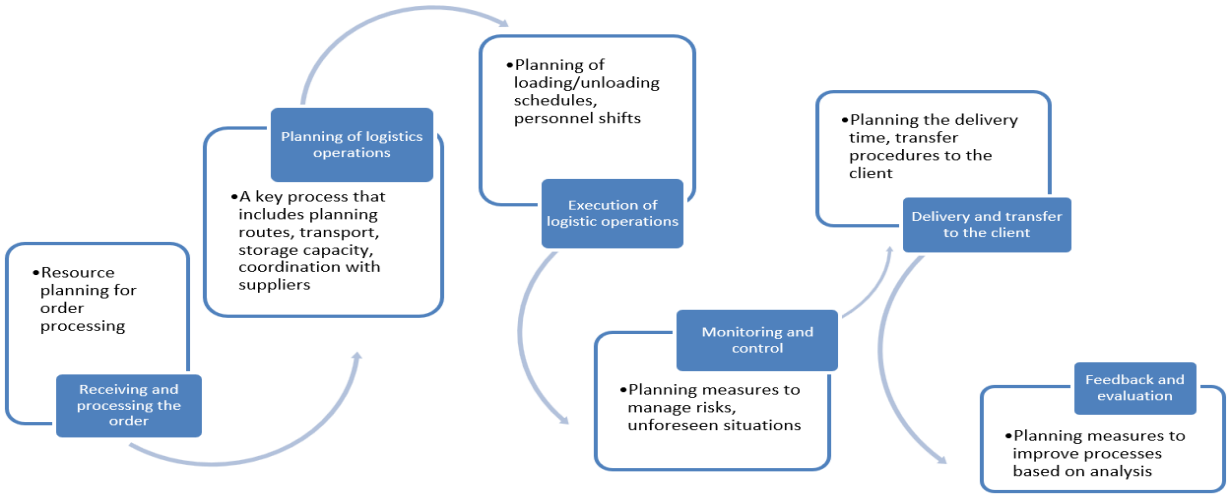


Figure 1.2 -The role of planning in the main processes of customer service

Source: developed by the author

Environmental sustainability is an approach aimed at integrating environmental considerations into all aspects of an organization's activities or processes. This includes minimizing negative environmental impacts, rational use of natural resources, and implementation of environmentally friendly technologies and practices. Environmental sustainability involves a comprehensive consideration of environmental factors at all stages of planning, production, operation and disposal of products or services [18,29].

Achieving such environmental sustainability requires careful planning and implementation of appropriate processes in the company's operations. A process is a logically interrelated sequence of activities or operations that transforms inputs into desired outputs or products. A process has clearly defined inputs, processing or transformation steps, and an end goal or output. Processes can be physical, chemical, biological, or informational, depending on the nature of the activity [10,38].

In the context of environmentally oriented customer service in a logistics company, the term “process” covers the entire sequence of operations, from the customer's order to the delivery of goods or services. This process should be planned

and implemented with environmental considerations and minimization of harmful environmental impact at each stage [5,40].

Let's take a closer look at the process of planning customer service in a logistics company regarding environmental aspects.

Planning is an integral part of the successful management of any organization, especially in the logistics sector, where customer satisfaction and operational efficiency are key factors. However, in today's reality, companies must also consider the environmental impact of their operations and implement appropriate practices to minimize the negative impact on the environment. Therefore, the process of planning customer service in a logistics company should include an environmental component [19,44].

It consists of several basic steps that can be applied to planning an environmentally friendly customer service process (see Figure 1.3):

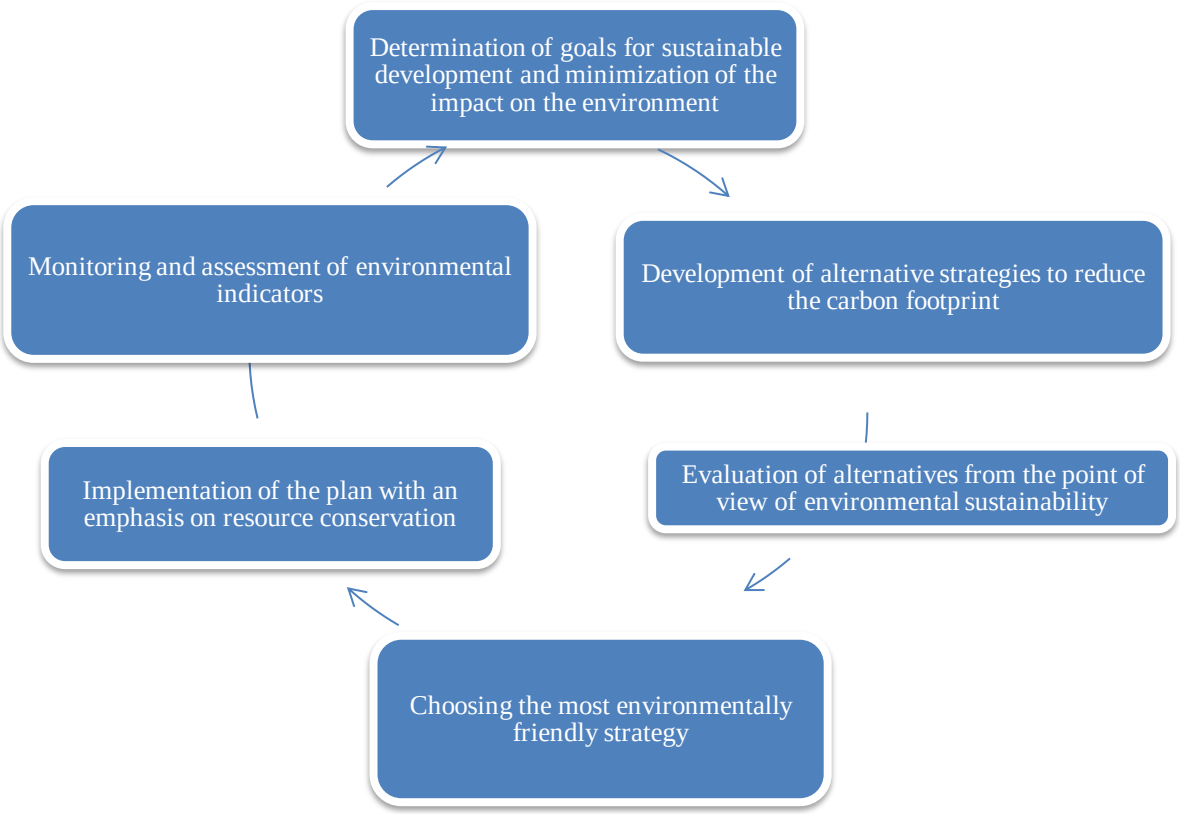


Figure 1.3 – Planning cycle of environmentally-oriented customer service

Source: compiled according to the data [53]

1. Setting objectives for sustainable development and reducing environmental impact. During this phase, the company sets clear environmental goals and objectives that it aims to achieve in its operations. These include reducing emissions, optimizing resource usage, and minimizing the company's environmental footprint.

2. Exploring different approaches to minimize the carbon footprint. This step entails exploring and assessing various methods, advancements, and resolutions that can contribute to the reduction of carbon emissions and the overall environmental impact in the customer service process.

3. Considering different options based on their impact on the environment. During this stage, a thorough analysis and evaluation of different strategies and approaches are conducted to assess their potential impact on the environment, costs, effectiveness, and alignment with the company's environmental objectives.

4. Exploring the most eco-conscious approach. After a thorough assessment of the options, the most ideal approach is selected, prioritizing sustainable development principles, and minimizing harm to the environment.

5. Implementation of the plan with a focus on conserving resources. The selected approach is implemented, with a focus on optimizing resource utilization, reducing waste, and implementing environmental conservation measures. We also monitor and assess environmental indicators.

The cycle is repeated to continually improve and find new, more effective approaches to environmentally focused customer service.

Such an iterative planning methodology allows a logistics company not only to improve the quality of customer service but also to integrate environmental practices into its operations, which meets the modern requirements of sustainable development and social responsibility of business.

The way companies plan their customer service processes within this environmentally conscious framework is central. To seamlessly combine both elements without compromising quality or efficiency; careful planning becomes imperative.

Planning an eco-conscious customer service process requires a fundamental rethinking of existing paradigms on what constitutes exceptional service, while at the same time promoting a spirit of sustainability - a challenging, albeit rewarding, task indeed [2].

It begins by weaving together two often disparate threads - business operations (namely supply chain) efficiency alongside green initiatives - to create a model in which these dimensions are quite harmoniously combined, rather than standing at opposite ends of the spectrum.

Appendix A provides a general diagram of the logistics service process, which defines the main stages of the customer service process, namely:

1. Resilience - the ability to adapt to disruptions caused by changing environmental rules.

2. Flexibility - the ability to customize to meet changing customer needs.

3. Visibility - Transparency about the end-to-end cycle, including the sustainability measures of suppliers.

4. Environmental innovation - advanced technologies that increase energy efficiency and reduce carbon footprint.

When developing a customer service process for a logistics company with a focus on the environment, it is important to consider how the principles of logistics planning can be applied.

– Segment customers according to their environmental service needs and adjust logistics processes to efficiently cater to these segments.

– Revise the ecological logistics network to align with the demands of sustainable development and profitability for various customer segments.

– Stay updated on market trends and effectively manage demand planning for environmental services throughout the logistics chain to ensure accurate forecasts and efficient resource allocation.

– Efficiently oversee sustainable sourcing practices to minimize environmental impact and optimize cost-effectiveness of materials and services.

– Enhance eco-conscious services that are more accessible to clients and expedite the shift towards sustainable logistics practices.

– Create a comprehensive environmental strategy for the entire logistics chain that enhances decision-making at different levels and offers a transparent understanding of the movement of products, services, and information, while considering environmental factors.

– Utilize performance indicators that cover the entire logistics chain to assess the overall achievement of sustainability goals for end users.

By implementing these principles, the logistics company can effectively incorporate environmental factors into their planning process and deliver environmentally conscious services to customers at a superior level.

In conclusion, organizations must take calculated risks to integrate excellent customer service with sustainable practices to prepare for an ecologically conscious consumer experience. This marks the beginning of a transformative shift, where businesses prioritize both profitability and environmental preservation, establishing a mutually beneficial partnership. By employing strategic planning and utilizing data-driven decision-making, it is possible to overcome challenges, resulting in both tangible advantages such as cost reduction through waste reduction and intangible benefits like enhanced brand reputation.

1.2 Global experience of greening the logistics company's customer service process

Amid growing environmental consciousness, several companies in various industries are actively integrating sustainability into their business models. Nevertheless, it is crucial for these sectors to expand their environmentally friendly tactics beyond only production and integrate them into all facets of their operations, including customer service procedures.

Customer service, which encompasses actions focused on satisfying customer requirements and building lasting relationships, offers numerous chances to incorporate environmentally sustainable practices. These practices can yield financial advantages and have a good influence on the environment [13,42].

The customer service process is crucial since it directly impacts customer satisfaction and their commitment to the organization. Hence, it should be examining the overall framework of the logistical service process for customers, followed by proposing specific enhancements that arise from the implementation of ecologically sustainable or "green" technology [7,43].

1. The process of order logistics service:

- Resource allocation for order fulfillment, including materials, labor, and transport planning.

- Strategizing the procedure for commencing and executing commands.

2. The warehouse service process involves the strategic organization and management of warehouse operations and inventories.

- Strategizing the allocation of supply routes originating from warehouses.

3. The procedure of providing transportation and logistical services:

- Strategizing optimal routes and coordinating transportation schedules.

- Coordination of vehicle loading and unloading operations.

4. The procedure for providing logistics services for customer orders:

- Strategizing the organization and coordination of document flow and its corresponding documentation.

- Strategizing the implementation of service quality control measures and resolving challenging situations.

5. Order fulfillment: - Strategizing collaborative relationships with customers.

- Strategizing the selection and standard of services based on consumer requirements.

- Strategizing the administration of operational processes inside the logistics system.

- Strategizing the enhancement of cost efficiency in logistics planning.

Therefore, the planning function is crucial at every phase of providing logistical service to consumers, as it guarantees efficient organization and coordination of all essential activities and resources.

As a result, the use of "green" technology at various levels of the logistics service will not only enable the company to boost the level of environmental responsibility, but it will also enable the company to increase the efficiency of its operations and improve its image in the eyes of customers who are environmentally sensitive [20,21,47].

The accompanying scheme, which provides an overview of the different elements and approaches that may be employed for a more ecologically sustainable logistics operation, will be helpful as we examine the technologies that can be used to enhance customer service (see Figure 1.4).

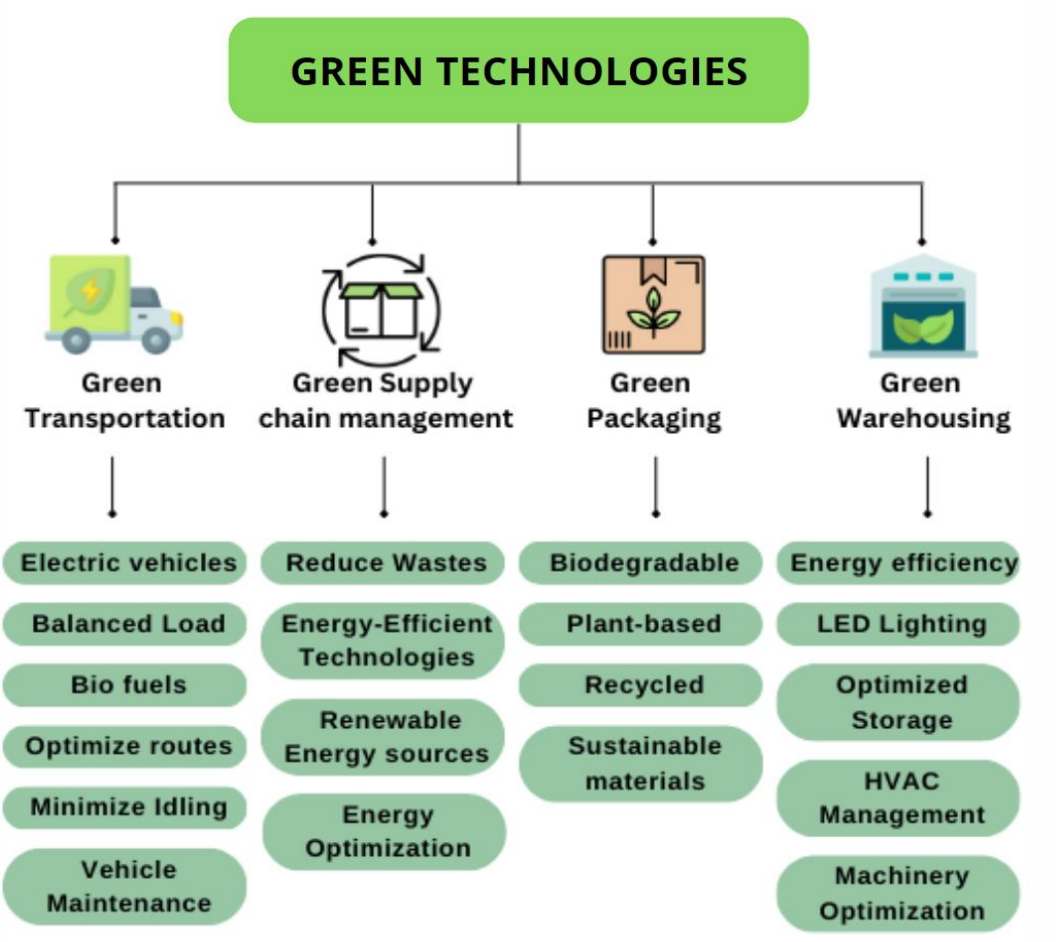


Figure 1.4 – Green supply chain technologies to improve customer service

Source: compiled according to the data [54]

Four main areas are emphasized at the top level: green transport, green supply chain, green packaging, and green warehousing.

Under each of these categories, we can find specific examples of solutions and technologies that are environmentally friendly. For instance, when it comes to green transport, there are several strategies that can be implemented. These include the adoption of electric vehicles, the utilization of biofuels, the optimization of routes, and the reduction of vehicle idling. Regarding green packaging, we can consider utilizing materials that are biodegradable, derived from vegetables, or made from recycled materials that can be reused.

Overall, this initiative encompasses a broad array of initiatives aimed at implementing environmentally-friendly practices across different aspects of logistics, including transportation, warehousing, and supply chain management. The ultimate objective is to reduce the adverse effects on the environment and transition towards a more sustainable business model.

Green logistics practices, once seen as precautionary measures, now have an impact on all aspects of value chains and are now essential for conducting business. Adhering to environmental standards can not only decrease carbon emissions but also enhance the efficiency of organizations' operations. Below are many instances illustrating how incorporating environmentally-friendly practices into the customer service process can assist to the advancement of sustainable development [15,16,46].

1. Minimizing paper consumption -The utilization of digital communication and electronic documents can substantially decrease the requirement for paper. This not only promotes environmental sustainability but also decreases the expenses associated with acquiring and managing paper documents.

2. Encourage staff to adopt recycling habits - Encouraging the adoption of recycling habits and proper waste management practices can effectively mitigate adverse environmental effects. Companies can implement training programs and raise awareness among employees regarding the significance of recycling and the appropriate utilization of resources.

3. Decreased operational expenses - Implementing environmentally friendly methods can result in reduced expenditures for electricity, water, and other essential resources. For instance, employing energy-efficient machinery and optimizing processes can effectively decrease operational expenses.

4. Enhanced customer confidence - Implementing a proactive greening plan helps foster trust and confidence among customers. Timely comprehension and proactive addressing of social and environmental concerns might mitigate the adverse consequences of unfavorable public perception.

By considering these factors, enterprises can attain greater sustainability, guarantee environmental security, and safeguard nature for future generations.

In a prime example from Europe, DB Schenker, a leading international logistics services provider, has revamped its entire structure to align with sustainability goals, including the introduction of an online self-service portal that eliminates a huge amount of non-printed material, thereby reducing annual paper use by thousands of metric tons, as well as dramatically improving efficiency.

DB Schenker is committed to sustainability and environmental responsibility. They have initiated 350 sustainability initiatives and offer 4 eco-friendly products. One of their key targets is to save 180,000 tons of CO2e by 2025 through various measures, including switching to 100% renewable electricity. In June 2022, DB Schenker organized the Sustainable Logistics Forum, which brought together customers, partners and industry experts to discuss climate change, sustainability and common ESG challenges in transportation and logistics [55,30].

DHL Express, a well-known courier company, has made significant investments in improving its environmental performance. Technology systems, such as chatbots with AI-powered voice assistants, reduce call center workloads while saving energy, contributing to less e-waste, demonstrating harmony between innovative sustainable approaches. strategically planned designed to not only have a favorable ecosystem, but also a better quality, optimized interactive customer support.

In April 2023, DHL hosted its first global summit in Valencia, Spain, entitled “The Age of Sustainable Logistics”. At this event, they unveiled impressive

sustainability milestones, including more than 30,000 electric vehicles in their fleet, sourcing more than 830 million liters of clean jet fuel in 2022, and more than half of DHL's supply chain facilities being carbon neutral [56].

There is a major contribution that the logistics industry makes to the overall CO2 emissions, and these businesses are taking measures to make the most of their efforts to be environmentally responsible. Through the implementation of techniques that are friendly to the environment, they are making a contribution to a more sustainable future for our world. which you can focus your attention on with the layout shown below in the image (see Figure 1.5):

Figure 1.5 - Global Logistics Emissions and methods to reduce carbon footprint [57]

One of the most important aspects of "greening" the process of providing customer service is determining the influence that it has on the environment. It is essential for companies that deal in logistics to make use of tools such as life cycle assessment (LCA) or carbon footprint analysis in order to ascertain the approximate emissions that are produced by activities related to customer service. With this information, they can then establish attainable objectives with the intention of effectively lowering these emissions over time through the implementation of innovative sustainability practices [31,50].

The current shift in perspective that we are facing is a result of the fact that global experience demonstrates that incorporating environmental principles into a company's core values and integrating them into all aspects, including customer relations, not only eliminates environmental impacts but also improves overall business performance by increasing efficiency, fostering stronger customer relationships, and positively impacting financial results. Businesses are beginning to recognize that individual roles contribute to a larger sphere of shared responsibility, but the reality of a sustainable world has not yet been realized.

1.3 Chapter 1 summary

In the theoretical chapter of the qualification work, the theoretical foundations of the planning of the logistics organization's customer service process were investigated with a strong emphasis on environmental issues. The importance of considering environmental factors at every step of planning to achieve sustainable development of the organization was determined.

The importance of a cyclical method of planning customer service oriented to the environment has been established. This method includes defining the goals of sustainable development, choosing the most environmentally friendly ways, implementing the plan and constantly monitoring the results. Fundamental principles of logistics planning regarding environmental issues were also outlined.

Examples of global practice of using environmentally friendly measures in the field of customer service of logistics organizations are considered. Taking into account the world experience, logistics organizations should give priority to the development of an environmentally friendly customer service procedure as an important first step towards sustainable development. Integrating effective business practices with environmental protection not only minimizes negative consequences, but also increases the company's efficiency and reputation among customers.

CHAPTER 2
ANALYSIS OF ENVIRONMENTALLY ORIENTED ACTIVITIES OF THE LOGISTICS COMPANY DSV

2.1 General characteristics of the logistics company

DSV is a renowned logistics company with a rich history. The company was first founded in Denmark in 1976. Since its inception, DSV has grown rapidly, mainly via acquisitions. It offers transport services worldwide by road, air, sea, and train, with the bulk of its activities coming from its European trucking network and airfreight and sea freight forwarding businesses [8].

In 2021, DSV made a significant move by acquiring Agility's Global Integrated Logistics business (GIL), a leading global transport and logistics provider with a strong footprint in emerging markets. This acquisition propelled DSV to become a global top-three player within transport and logistics [8].

Today, DSV provides services such as transport, warehousing, and inventory management for various industries, including automotive and healthcare. It operates in over 90 countries, offering air freight, sea/ocean freight, road freight, rail freight, and contract logistics [1,9].

As a global freight forwarder, DSV provides and manages supply chain solutions for thousands of companies every day. Whether you are a small family-run businesses or large global corporation they focus on keeping your supply chains flowing through operational excellence and sustainable growth. This is at the core of our purpose, vision, and mission.

Their skilled people with industry know-how, modern warehouses, strong carrier relationships and a global network across 80 countries position us to better serve your needs. They help you achieve your business objectives through a unique blend of optimized and flexible solutions, combined with visibility tools, secure IT

infrastructure and sustainability. The top 20 global freight forwarders and market share by revenue for 2020 are shown in the figure below (see Fig. 2.1). This gives us data to calculate the market share of DSV A/S. The main competitors of DSV A/S can also be determined based on the data above. DSV aims to be a leading global supplier, fulfilling customer needs for transport and logistics services, targeting extensive growth and being among the most profitable in its industry.

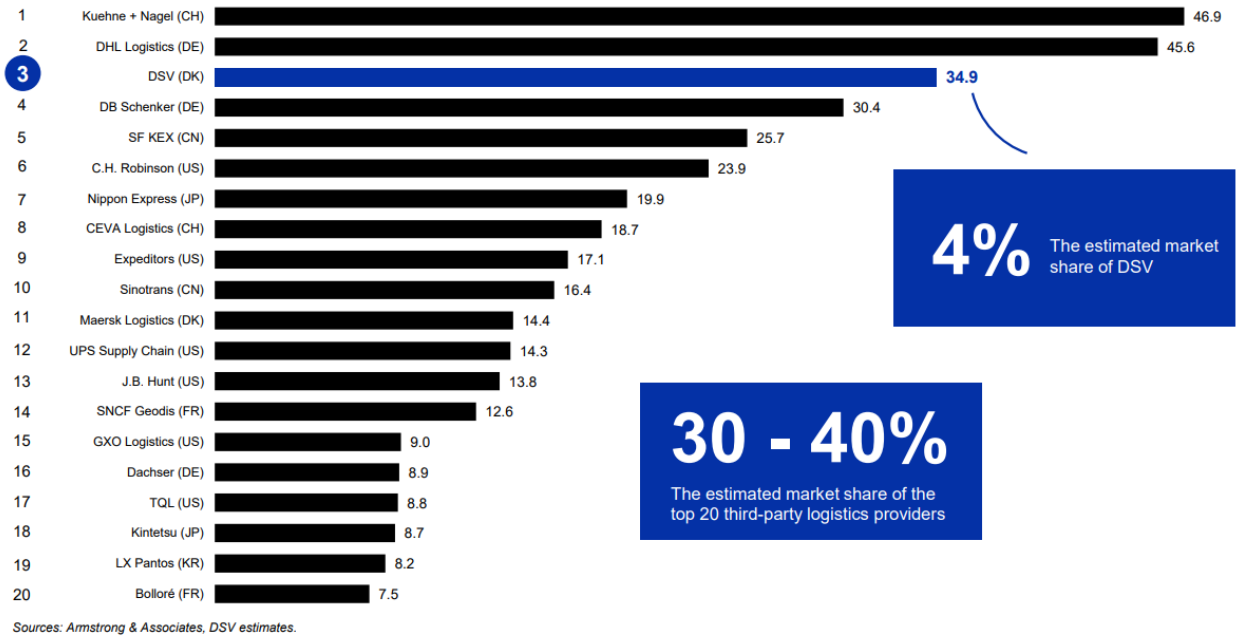


Figure 2.1 - The main companies in the logistics industry and their market share [8]

Fig.2.1 displays the essential aspects of the DSV competitive landscape and industry trends.

DSV is one of the top three worldwide freight forwarders, holding a market share of around 4%. The collective market share of the top 20 freight forwarders is roughly estimated to be between 30% and 40%. The remaining portion of the business is comprised of a multitude of regional and local forwarding providers. Large freight forwarders like DSV have an advantage in the fragmented industry owing to their scale and logistical capabilities. This allows them to consolidate the market and expand their market share. DSV's track record of acquiring other companies is a compelling illustration of this, and the trend of merging and integrating businesses is anticipated to persist in the foreseeable future.

Changes in global supply chains, geopolitical developments and new technologies are affecting DSV's customers and the demand for transportation and logistics services. Important trends include dual sourcing, regionalization of production, automation and new technologies, and growing demands for sustainability and decarbonization. A DSV needs to understand these dynamics to respond quickly to opportunities and mitigate threats.

The articulated strategy of DSV revolves around its corporate purpose of "keeping supply chains flowing in a world of change." The company identifies four focus areas to deliver on this purpose: sustainable growth, customer satisfaction, employee well-being, and operational excellence. With a commitment to creating long-term value for stakeholders and preparing DSV for the future, the company emphasizes its role in helping customers grow sustainably (see Fig. 2.2).

Figure 2.2 - Focus areas in DSV strategy by 2023 [8]

DSV achieves this by leveraging a comprehensive range of logistics services, competitive pricing, and a strong global presence to enhance the customer experience.

The DSV management hierarchy and corporate governance structure are shown in the figure Fig. 2.3. The Annual General Meeting, when shareholders use their voting rights, is at the top. The Board of Directors follows, outlining the general goals, strategy, and vision of the business. The Board is supported by its committees. The

Executive Board, which reports to the Board of Directors, is in charge of carrying out the Group's daily operations and strategy. The Division Management, which sits beneath the Executive Board, is in charge of overseeing the day-to-day operations of the Road, Air & Sea, and Solutions divisions. The divisions get centralized assistance from the Group functions. The Sustainability Board, which probably manages the business's sustainability reporting and strategies.

The hierarchy permits effective execution and decision-making at various organizational levels while guaranteeing that the company's operations are in line with the strategic objectives established by the Board of Directors.

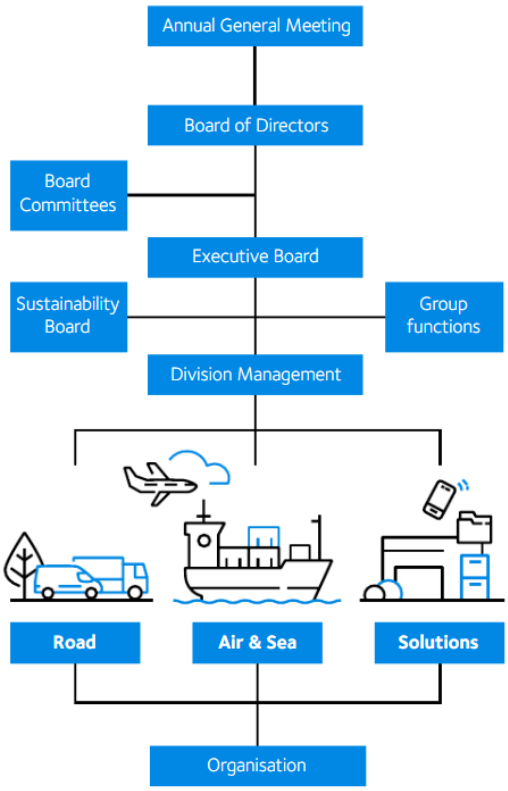


Figure 2.3 - Structure of the company [8]

From the preliminary information we can understand that DSV A/S, formerly DSV Panalpina A/S, is a Denmark-based company engaged in transportation and logistics services. The Company’s operations are divided into three business segments [1,5]:

- The Air and Sea service, which provides air and sea freight services across the globe.

- The Road, which includes road freight services across Europe, North America, and South Africa.

- The Solutions segment, offers contract logistics services, including warehousing and inventory management, across the globe.

Structure of services provided by DSV is presented in Fig. 2.4.

Figure 2.4 - Structure of services provided by DSV [14]

Additionally, the functionality of their services is summarized in Fig. 2.5.

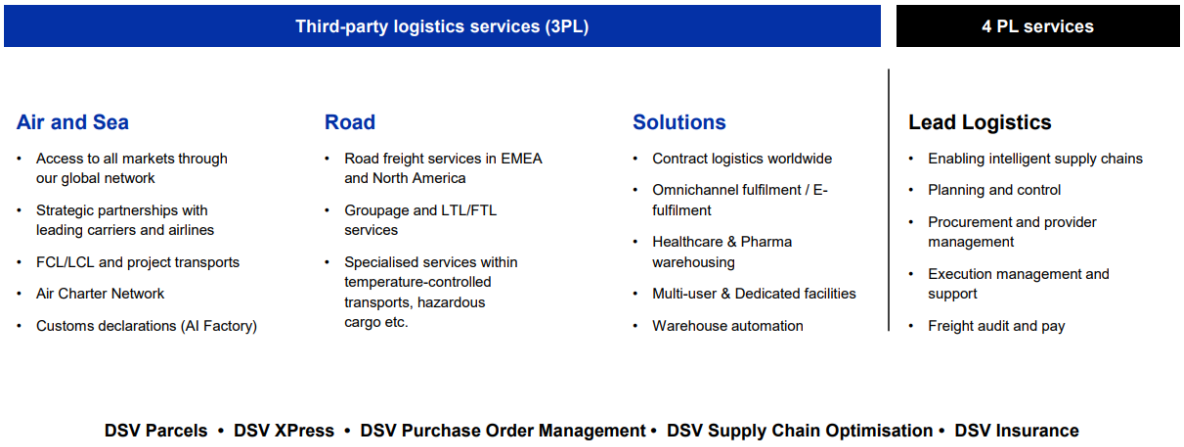


Figure 2.5 - Logistics services by DSV [14]

Understanding the business model of the organization is essential to doing a more thorough analysis of its capabilities. Their business model is flexible and asset light, which helps us to keep supply chains flowing efficiently, from shipper to consignee (see Fig. 2.6.).

Their business model is flexible and asset light, which helps to efficiently ensure the movement of supply chains from sender to receiver. The asset light model allows DSV to quickly scale up operations in response to changes in market demand or modes of transportation. It also helps to select the best partners for any service based on reliability, available capacity, sustainability factors, transit time, and price.

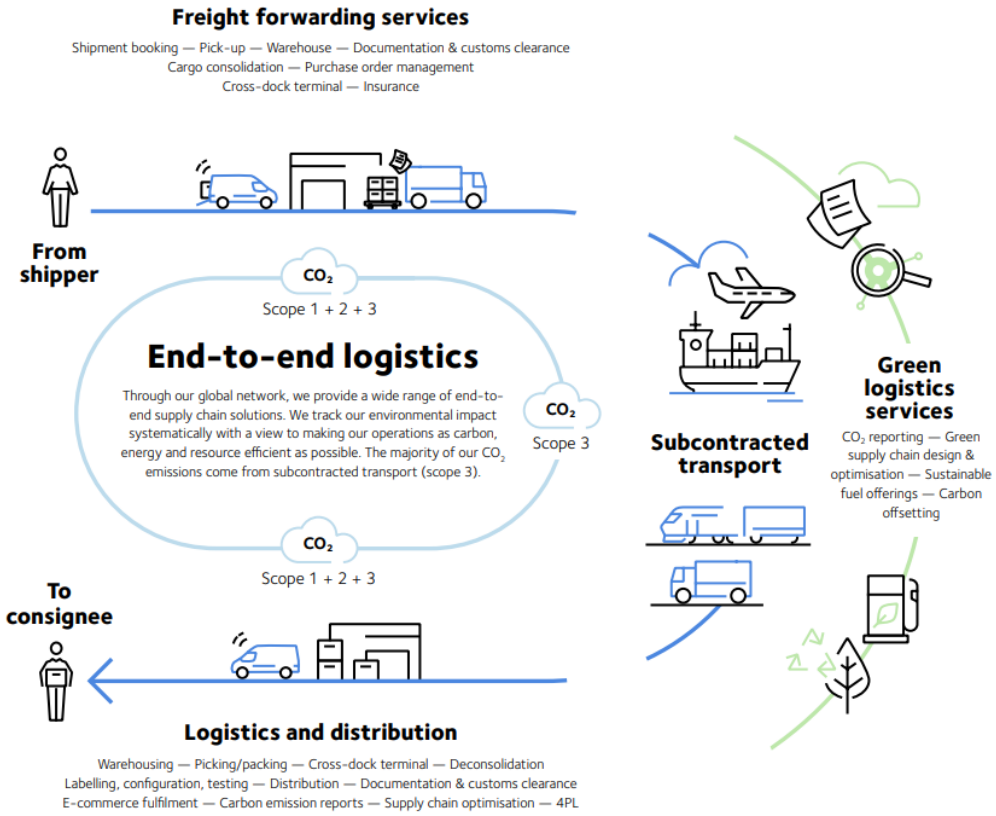
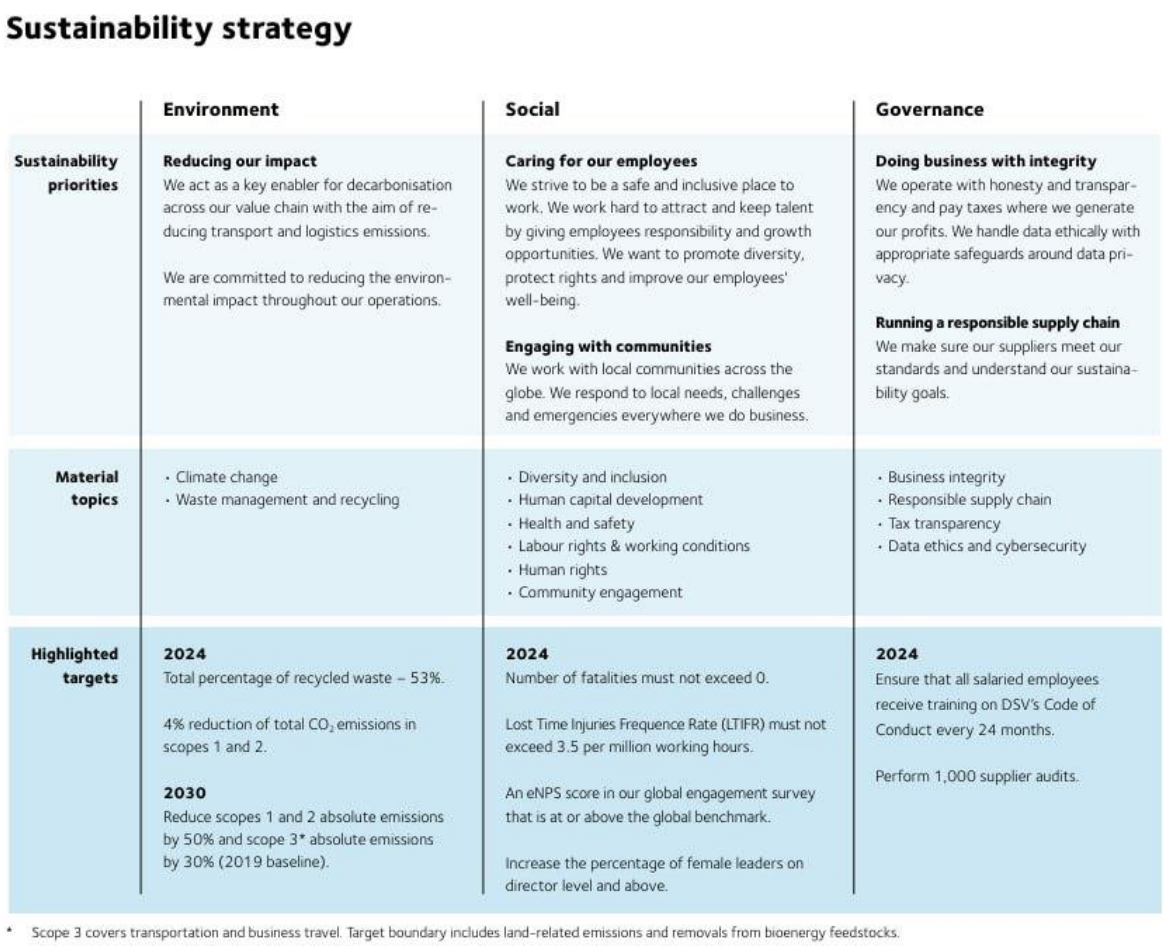


Figure 2.6 - DSV business model 2022 [8]

Despite its global scale, DSV always remains close to local markets. By working with container carriers, airlines, road and rail operators, they move cargo to the right places. As one of the largest buyers in the global market, DSV and its customers receive favorable prices and strong long-term relationships with carriers.

DSV offers a unique combination of highly skilled employees with industry knowledge, advanced IT systems, modern warehouses and terminals, strong carrier relationships and a global network in more than 80 countries. In addition to transportation, customers purchase from DSV a full range of forwarding, logistics and distribution services, including supply chain management centers for monitoring and optimization. DSV's business processes are highly digitalized, and their systems are tightly integrated with customers and suppliers. To reduce its environmental footprint, DSV works closely with customers and suppliers to track and minimize emissions throughout the supply chain.

Financial targets for 2026 financial year are represented in Fig. 2.7.



Sustainability strategy

	Environment	Social	Governance
Sustainability priorities	**Reducing our impact** We act as a key enabler for decarbonisation across our value chain with the aim of reducing transport and logistics emissions. We are committed to reducing the environmental impact throughout our operations.	**Caring for our employees** We strive to be a safe and inclusive place to work. We work hard to attract and keep talent by giving employees responsibility and growth opportunities. We want to promote diversity, protect rights and improve our employees' well-being. **Engaging with communities** We work with local communities across the globe. We respond to local needs, challenges and emergencies everywhere we do business.	**Doing business with integrity** We operate with honesty and transparency and pay taxes where we generate our profits. We handle data ethically with appropriate safeguards around data privacy. **Running a responsible supply chain** We make sure our suppliers meet our standards and understand our sustainability goals.
Material topics	• Climate change • Waste management and recycling	• Diversity and inclusion • Human capital development • Health and safety • Labour rights & working conditions • Human rights • Community engagement	• Business integrity • Responsible supply chain • Tax transparency • Data ethics and cybersecurity
Highlighted targets	**2024** Total percentage of recycled waste – 53%. 4% reduction of total CO_2 emissions in scopes 1 and 2. **2030** Reduce scopes 1 and 2 absolute emissions by 50% and scope 3* absolute emissions by 30% (2019 baseline).	**2024** Number of fatalities must not exceed 0. Lost Time Injuries Frequence Rate (LTIFR) must not exceed 3.5 per million working hours. An eNPS score in our global engagement survey that is at or above the global benchmark. Increase the percentage of female leaders on director level and above.	**2024** Ensure that all salaried employees receive training on DSV's Code of Conduct every 24 months. Perform 1,000 supplier audits.

* Scope 3 covers transportation and business travel. Target boundary includes land-related emissions and removals from bioenergy feedstocks.

Figure 2.7 - Sustainability strategy chart of DSV A/S [8]

The three primary pillars of the company's sustainability strategy—environment, social responsibility, and corporate governance—are represented by this image.

The company's decarbonization, lowering emissions from logistics and transportation, and making a general commitment to lowering the environmental footprint across all activities are the top priority when it comes to the environment. Climate change, recycling, and waste management are important subjects. By 2024, 53% of garbage should be recycled, and overall CO2 emissions in Scopes 1 and 2 should be reduced by 4%. The objective is to decrease the absolute emissions in Scope 1, 2, and 3 by 50% and 30%, respectively, by 2030 in comparison with the baseline for 2019.

The social component emphasizes employee care by advancing well-being, diversity, and inclusiveness as well as possibilities for professional growth. It also entails interacting with local communities globally to address their crises and needs. Diversity, the development of human capital, health and safety, labor rights, human rights, and community involvement are the main issues. The objectives for 2024 include an engagement survey score that is at or above the worldwide standard, zero deaths, and a lost time injury frequency rate (LTIFR) of no more than 3.5 per million work hours. Another objective is to raise the proportion of female directors and higher-level executives.

A responsible supply chain, ethical data processing, paying taxes where earnings are earned, and doing business with honesty are all stressed by the corporate governance component. Business ethics, ethical supply chains, tax transparency, and cybersecurity and data ethics are important subjects. In addition to conducting 1,000 supplier audits, the objectives for 2024 include making sure that all paid workers undergo training on the Code of Conduct every 24 months.

The company's commitment to sustainable and ethical business practices is demonstrated by this sustainability strategy, which, in summary, outlines a comprehensive approach to the environmental, social, and governance aspects of corporate governance. It also includes specific key themes and measurable targets for 2024 and 2030.

The last component is a look at the company's growth over the years. This image illustrates the evolution of DSV from a local transportation company to a global player in the logistics and freight market. The graphs and charts demonstrate how the company has expanded over the decades through organic growth and a mergers and acquisitions (M&A) strategy.

The top chart shows the distribution of operating profit (EBIT) by division for 2023. The Air and Marine division has the largest share, followed by the Automotive and Solutions divisions. The bottom chart shows the geographical distribution of EBIT, with Europe (EMEA) accounting for the largest share, followed by the Americas and APAC. The curve on the chart shows DSV's revenue and EBIT growth since 1976, highlighting key milestones and years of acquisitions of other companies such as Samson (1997), DFDS Dan Transport (2000), ABX LOGISTICS (2008), UTi Worldwide (2016) and Panalpina (2019).

From a small Danish company with 10 independent transport units in 1976, DSV has grown to a global operator with revenues of DKK 150,785 million and EBIT of DKK 17,723 million in 2023 (see Fig. 2.8.).

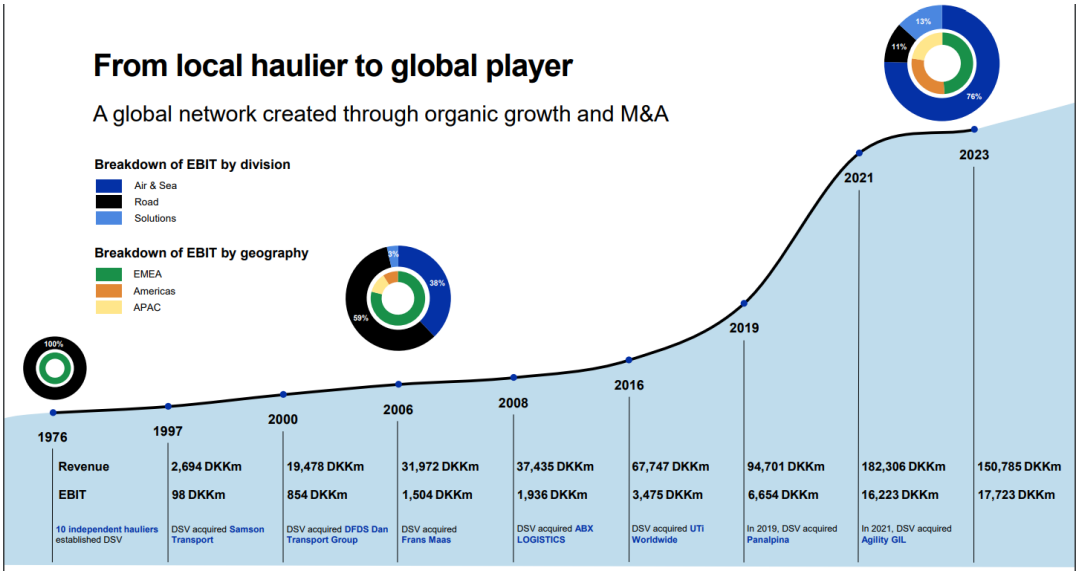


Figure 2.8 - DSV's journey from local carrier to global industry leader [6]

DSV, a global transportation company, has transformed into a leader through its M&A strategy. The company has diversified into three main divisions: air, sea, road,

and solutions. The air and sea transportation division drives growth and profitability. DSV's revenue comes primarily from the EMEA region. Despite its global presence, DSV started as a Danish regional transportation firm over 47 years.

2.2 Diagnostics of the company's financial and economic condition

The analysis of production and financial indicators of LLC "DSV LOGISTICS" is an important task for evaluating the effectiveness of the company's functioning and revealing key aspects of its financial condition and operational activity. The analysis allows to obtain objective information about the functioning of the company and determine the priority areas of development.

The main economic indicators of the company's activity in the period from 2021 to 2023 are presented in Table 2.1.

The company has shown significant growth in financial performance in 2022 compared to 2021, including growth in revenue, gross profit, EBITDA and operating profit. However, in 2023, most of the key financial indicators such as revenue, gross profit, EBITDA and operating profit decreased compared to 2022, which may indicate some problems or challenges in the company's business.

Despite the decline in absolute numbers in 2023, the company's margins (gross margin and operating margin) continued to improve, indicating more effective cost management. The conversion ratio (the ratio of EBITDA to gross profit) improved in 2022 but worsened in 2023, which could indicate a decline in operating efficiency. Personnel costs increased in all three years, although the number of employees decreased, which may indicate an increase in wages or other personnel costs. Overall, although 2022 was quite successful for DSV Group, the company faced some difficulties in 2023, which affected its financial results.

Table 2.1 - Indicators of the company's activity in the period 2021-2023 [8]

(DKKm)	FY 2021	FY 2022	FY 2023	Deviation, % 2021-2022	Deviation, % 2022-2023
Revenue	182 306	235 665	150 785	29,27	(36,02)
Direct costs	144 691	183 516	106 967	26,83	(41,71)
Gross profit	**37 615**	**52 149**	**43 818**	**38,64**	**(15,98)**
Other external expenses	4 173	5 559	4 838	33,21	(12,97)
Staff costs	13 025	16 315	15 983	25,26	(2,03)
EBITDA before special items	**20 417**	**30 275**	**22 997**	**48,28**	**(24,04)**
Depreciation of right-of-use assets	3 144	3 783	3 981	20,32	5,23
Amortisation and depreciation of owned assets	1 050	1 288	1 293	22,67	0,39
EBIT before special items	**16 223**	**25 204**	**17 723**	**55,36**	**(29,68)**
Special Items, net costs	478	1 117	-	133,68	(100,00)
Financial income	206	606	473	194,17	(21,95)
Financial expenses - lease liabilities	495	727	851	46,87	17,06
Financial expenses	552	745	855	34,96	14,77
Profit before tax	**14 904**	**23 221**	**16 490**	**55,80**	**(28,99)**
Tax on profit for the period	3 650	5 550	4 083	52,05	(26,43)
Profit for the period	**11 254**	**17 671**	**12 407**	**57,02**	**(29,79)**
Gross margin, %	*20,6*	*22,1*	*29,1*	*7,28*	*31,67*
Operating margin, %	*8,9*	*10,7*	*11,8*	*20,22*	*10,28*
Conversion ratio, %	*43,1*	*48,3*	*40,4*	*12,06*	*(16,36)*
Tax percentage	*24,5*	*23,9*	*24,8*	*(2,45)*	*3,77*
Blue-collar costs (included in direct costs)	*6 280*	*7 647*	*7 669*	*21,77*	*0,29*

Graphically, these main indicators are displayed in Fig. 2.9.

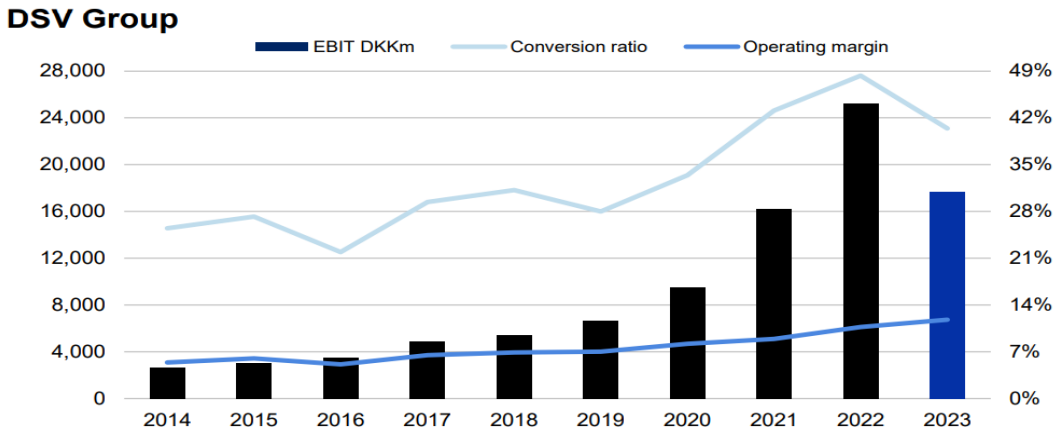


Figure 2.9 - Dynamics of the main economic indicators [14]

Fig. 2.10 presents a comprehensive study of the company's financial performance for the years 2021, 2022, and 2023, divided into Air & Sea, Road, and Solutions divisions

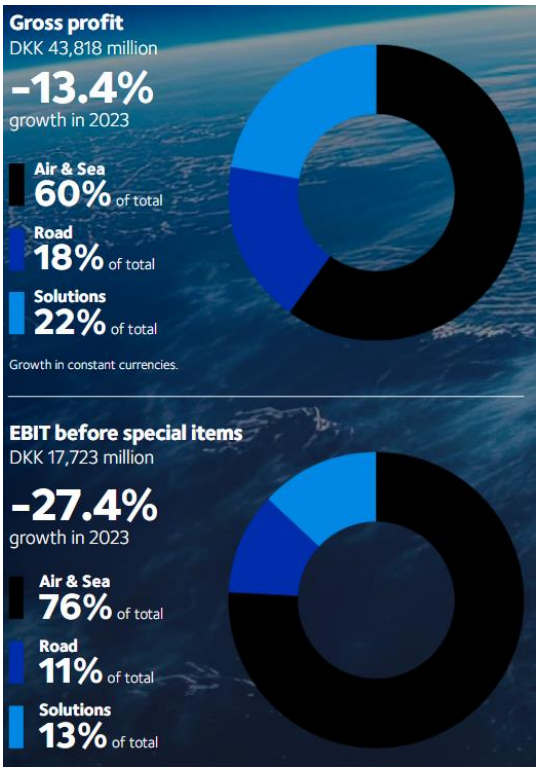


Figure 2.10 - The segmentation of financial data for 2023 into enterprise segments [14]

Fig.2.10 shows the distribution of gross profit amounting to DKK 43,818 million in 2023. Air & Sea contributes 60% of the total, Road accounts for 18%, and Solutions make up 22%. Nevertheless, the gross profit in 2023 experienced a 13.4% decline in comparison to the preceding year.

The second pie chart depicts the allocation of operational profit before exceptional items, which was DKK 17,723 million in 2023. The distribution of transportation modes is as follows: Air & Sea accounting for 76%, Road for 11%, and Solutions for 13%. In 2023, there was a 27.4% growth compared to 2022.

In Appendix B is presented comprehensive financial information for each business divisions of the company.

The Air & Sea division had a decline of 29.38% in sales in 2023 compared to 2021, amounting to DKK 92,438 million. However, the operational profit before

special items saw a 4.66% increase, reaching DKK 13,363 million. The gross profit had a 9.26% increase, but other expenses, including staff costs, saw a 19.38% increase. The investments declined by 89.71% to DKK 1,776 million, while the assets decreased by 17.16% to DKK 80,257 million. The liabilities had a decline of 36.94%, amounting to DKK 50,336 million.

In the Road category, the revenue is shown a 7.58% growth, reaching DKK 35,509 million in 2023. The operating profit, excluding exceptional items, rose by 8.19% to DKK 2,009 million. Nevertheless, the gross profit saw a substantial decline of 88.92%, amounting to DKK 786 million. The costs related to personnel climbed by 13.50%, while the expenses for other external factors rose by 27.27%. The investments had a decline of 46.02% to DKK 1,057 million, but the total assets saw a rise of 6.49% to DKK 25,702 million. The liabilities had a 7.08% drop, amounting to DKK 17,547 million.

Revenue in the Solutions area saw a significant growth of 24.98%, reaching DKK 22,482 million in 2023. Nevertheless, the operating profit before special items experienced a modest growth of 32.68% to DKK 2,355 million. The gross profit had a substantial decline of 85.71% to DKK 951 million, but human expenses witnessed a notable increase of 45.31%. The investments had a significant growth of 26.98%, reaching a total of DKK 5,229 million. Similarly, the total assets expanded by 11.82% to DKK 29,347 million, while liabilities rose by 15% to DKK 23,357 million.

The company's total sales had a decline of 17.29% in 2023, amounting to DKK 150,785 million. The operating profit, excluding exceptional items, rose by 9.25% to DKK 17,723 million. The gross profit had a 16.49% growth, reaching a total of DKK 43,818 million. The investments declined by 72.64% to DKK 8,537 million, while the overall assets decreased by 8.85% to DKK 147,110 million and the liabilities decreased by 10.30% to DKK 78,144 million.

Key financial ratios of DSV Group's for 2023 are presented in Fig. 2.11.

The main findings are as follows: the company demonstrated a very high gross margin of 29.1%, which indicates effective management of costs to support its

operations. The operating margin was also quite high at 11.8%, reflecting the company's ability to generate revenue from its core business.

Ratios	2023	2022	2021
Financial ratios (%)			
Gross margin	29.1	22.1	20.6
Operating margin	11.8	10.7	8.9
Conversion ratio	40.4	48.3	43.1
Effective tax rate	24.8	23.9	24.5
ROIC before tax	17.8	25.1	19.6
Return on equity	17.6	24.1	18.4
Solvency ratio	46.7	45.0	45.9
Gearing ratio	1.5	1.0	1.4

Figure 2.11 - The main financial ratios in LLC "DSV LOGISTICS"[8]

The main findings are as follows: the company demonstrated a very high gross margin of 29.1%, which indicates effective management of costs to support its operations. The operating margin was also quite high at 11.8%, reflecting the company's ability to generate revenue from its core business. However, the conversion ratio (the ratio of EBITDA to gross profit) was relatively low at 40.4%, which may indicate challenges in transforming gross profit into operating profit. The effective tax rate was 24.8%, which is a typical rate for many companies. ROIC before taxes was 17.8%, which is quite an acceptable level of return on invested capital. Return on equity - 17.6% - is also at a satisfactory level. The solvency ratio of 46.7 indicates a strong liquidity position of the company. Finally, a leverage ratio of 1.5 indicates a moderate level of leverage. Overall, these financials show a fairly strong operational and financial position for DSV Group in 2023, with some areas for improvement such as conversion ratios and improved return on capital.

Let us break down the financial statements and evaluate them in order to have a better knowledge of the company's operations and finances. Analysis of the company's assets by their structure is shown in Table 2.2.

Intangible assets accounted for the largest share of non-current assets and remained relatively stable at around DKK 77,000 million during 2021-2023. Asset

usage rights increased from 13,709 million kroner in 2021 to 15,655 million kroner in 2023.

Table 2.2 - Assets analysis of a company

Indicators	2023	2022	2021	Dynamics (absolute deviation)	
				2023/2022	2022/2021
Share of intangible assets in the structure of non-current assets of a company	73,70%	74,30%	74,70%	-0,006	-0,004
Share of tangible assets in the structure of non-current assets of a company	20,90%	20,10%	19,50%	0,008	0,006
Investments in infrastructure	11,68	9,84	6,93	1,84	2,91
Fixed assets turnover ratio	3,01	2,7	2,43	0,31	0,27
Depreciation trend	11,90%	22,05%	23,59%	-0,1015	-0,0154
Return on assets	11,40%	10,00%	8,20%	0,014	0,018

Fixed assets remained unchanged at about 6,200 million kroner. Current assets such as accounts receivable, contract assets, and inventory declined from 2021 to 2023. Cash and cash equivalents also decreased from 8,299 million kroner in 2021 to 6,452 million kroner in 2023.

The balance sheet table presents the company's assets over the period from 2021 to 2023. It is divided into two main sections: current assets and non-current assets.

A vertical and horizontal analysis of financial indicators was also conducted, which shows that current assets represent assets that can be easily converted into cash within a year or one operating cycle (see Appendix C).

The table C.1 (see Appendix C) shows that current assets have decreased from 2021 to 2022 but increased from 2022 to 2023. This fluctuation could be attributed to factors such as changes in inventory levels, trade receivables, or cash and cash equivalents.

Non-current assets, which include long-term investments, property, plant, and equipment, and intangible assets, have exhibited a consistent year-over-year increase from 2021 to 2023. This trend suggests that the company has been investing in long-term assets, potentially for expansion, modernization, or acquisitions. The vertical analysis of assets indicates that non-current assets have increased their share in the overall structure, emphasizing a potential long-term investment strategy. The increase

in non-current liabilities, especially borrowings, suggests a strategic shift towards long-term financing. Additionally, the decrease in trade payables and accrued costs of services among current liabilities may signal changes in payment terms or improved working capital management.

Analyzes the structure of the company's assets for 2021-2023. About 73-75% of non-current assets are intangible assets, and 19.5-20.9% are tangible assets. Infrastructure investment increased from 6.93 in 2021 to 11.68 in 2023. The turnover ratio of fixed assets increased from 2.43 to 3.01, which indicates their more efficient use. The depreciation trend has slightly decreased in 2023. Return on assets improved from 8.2% in 2021 to 11.4% in 2023, reflecting a more efficient use of assets to generate income.

The balance sheet table also presents the company's equity and liabilities over the period from 2021 to 2023. Equity represents the company's net worth or the ownership interest of shareholders (see Appendix D).

The data for the DSV Group's liquidity indicators for the years 2021, 2022, and 2023 is presented in Table 2.3.

Table 2.3- Analysis of liquidity of a company

Indicators	Recommended value of coefficient	2023	2022	2021	Dynamics (absolute deviation)	
					2023/2022	2022/2021
Absolute liquidity ratio	>0,1	0,168	0,217	0,155	-0,049	0,062
Quick ratio	>0,7	1,218	1,204	1,107	0,013	0,098
Working capital ratio	>2	1,105	1,164	1,101	-0,059	0,063

The absolute liquidity ratio, which shows the company's ability to pay off current liabilities with the most liquid assets, was above the recommended value of 0.1 in all periods, demonstrating a sufficient level of liquidity. The quick liquidity ratio, which considers cash and receivables to cover short-term liabilities, also exceeded the recommended value of 0.7, indicating good solvency. The working capital ratio, which reflects the coverage of current liabilities by current assets, was higher than 2, which is considered an acceptable level. The dynamics of indicators in 2023 slightly worsened

compared to 2022 but remained at an acceptable level. In general, the analysis indicates the company's strong liquidity position, its ability to pay current liabilities in a timely manner, and the availability of sufficient working capital to finance operations.

In comparison to prior years, the balance sheet generally indicates a rise in obligations, particularly leases, and a concurrent decline in current assets and equity in 2023. This could point to specific difficulties with operating budget and liquidity management.

Analysis of financial stability and activity of the firm are shown in Table 2.4.

Table 2.4 - Analysis of financial stability

Indicator	2023	2022	2021	Dynamics (absolute deviation)	
				2023/2022	2022/2021
Equity Ratio	0,47	0,45	0,46	0,018	-0,009
Debt to Equity Ratio	1,13	1,22	1,17	-0,084	0,044
Debt Ratio	0,53	0,55	0,54	-0,018	0,009
Asset Coverage Ratio	1,88	1,82	1,85	0,062	-0,031
Working Capital to Current	0,11	0,09	0,14	0,018	-0,043
The Equity to Total Debt	0,88	0,82	0,85	0,062	-0,031

The solvency ratio remained within the essential range of 0.5, rising from 0.46 in 2021 to 0.47 in 2023. With a debt-to-equity ratio of 1.13, the level of borrowing is considered modest. The debt ratio of the firm, which is 0.53, is within the typical range of 0.5 to 0.7. There are enough current assets to meet current obligations, according to the Working Capital to Current Assets metric.

Operational activity indicators are analyzed and summarized in Table 2.5.

Table 2.5 - Analysis of business activity

Indicator	2023	2022	2021	Dynamics (absolute deviation)	
Receivable Turnover Ratio	5,51	6,86	3,63	2023/2022	2022/2021
Days Sales Outstanding	66,18	65,65	100,55	0,535	-34,900
Inventory Turnover Ratio	34,49	168,91	646,48	-134,417	-477,574
Days Inventory	10,58	2,16	0,56	8,422	1,601
Accounts Payable	11,52	15,63	8,49	-4,110	7,140
Days Payable Outstanding	31,68	23,35	42,99	8,332	-19,639
Total Asset Turnover	1,74	1,47	2,26	0,265	-0,788

Receivables had a shorter collection duration in 2023 - 66 days as opposed to 100 days in 2021. The turnover of accounts payable increased while that of inventory decreased. From 2.26 in 2021 to 1.74 in 2023, the total asset turnover fell, suggesting a less effective use of assets.

The examination of DSV Group's financial performance for the period of 2021-2023 reveals the following key findings: In 2022, the corporation exhibited a noteworthy improvement in its financial performance compared to 2021, with notable increases in sales, gross profit, EBITDA, and operating profit. Nevertheless, in 2023, the majority of crucial economic indicators exhibited a decline in comparison to 2022, potentially suggesting the presence of specific issues or obstacles inside the organization. Although there was a decrease in the overall numbers in 2023, the company's profit margins showed improvement, suggesting more effective control over costs.

The firm had robust sales expansion from 2021 to 2023, with consecutive double-digit percentage increments in both 2022 and 2023. During the same period, there was an increase in top-line growth along with enhancements in profitability margins, such as gross profit margin, operating profit margin, and net profit margin. Although sales increased in 2023, most profitability measures decreased compared to 2022, indicating probable difficulties in maintaining cost savings or operational leverage.

In the balance sheet, the total value of assets had a small fall in 2022 and a more substantial decrease in 2023. These declines were mainly caused by decreases in current assets, namely trade receivables and contract assets. In contrast, non-current assets have grown in proportion to the overall asset composition, suggesting a deliberate emphasis on long-term investments and the possibility of future expansion or acquisitions. During the two-year period, the equity position deteriorated as a result of declines in reserves and retained profits, leading to reduced total equity levels in both 2022 and 2023.

Simultaneously, the conversion rate worsened, indicating a potential decrease in operating efficiency. Despite a drop in the number of employees, there was a rise in staff costs. In 2023, the asset structure remained basically same, however, there was a

reduction in current assets and cash. There was an improvement in the return on assets. The liquidity positions remained robust. In general, the year 2022 was marked by considerable success. However, in 2023, the corporation encountered several challenges that had a significant impact on its financial performance.

In 2022, the corporation seemed to change its finance strategy by relying more on long-term debt. This was evident from the significant growth in non-current liabilities, namely borrowings. Concurrently, there was a decline in current liabilities, namely in trade payables and accumulated expenses of services. This might indicate alterations in payment terms or enhanced management of working capital.

In summary, the financial performance and position indicate an intricate interaction between strategic choices, operational modifications, and capital structure adaptations. Although the firm had significant growth in revenue and increases in profitability, recent decreases in profitability indicators and changes in the company's asset composition, equity, and debt levels suggest possible issues or changes in the company's business model or industry dynamics.

2.3 Analysis of the ecologically oriented process of customer service of the logistics company

"Reducing our impact" through decarbonization initiatives, lowering emissions from transportation and logistics, and limiting their entire environmental footprint throughout operations is one of DSV Logistics' top aims. This implies that the organization is prioritizing the improvement of its logistics and transportation operations to be more ecologically sustainable, which would directly influence the quality of customer service.

DSV's main aim is to achieve "Sustainable Development" and their primary goal is to attain "Operational Excellence". The company aims to contribute to the essential infrastructure that drives worldwide trade, assisting clients in expanding their

businesses while simultaneously minimizing the environmental impact of their supply chains. DSV's aim to achieve zero emissions by 2050 is a crucial factor in driving this plan.

DSV has an all-encompassing sustainability plan that addresses environmental, social, and corporate governance elements. Within the realm of environmental concerns, the primary objectives include minimizing the company's impact by implementing decarbonization measures, mitigating emissions from transportation and logistics, and demonstrating a comprehensive dedication to reducing the total environmental impact across all operational activities [6,14].

DSV has established aggressive emissions reduction objectives based on scientific principles (see Fig. 2.12).

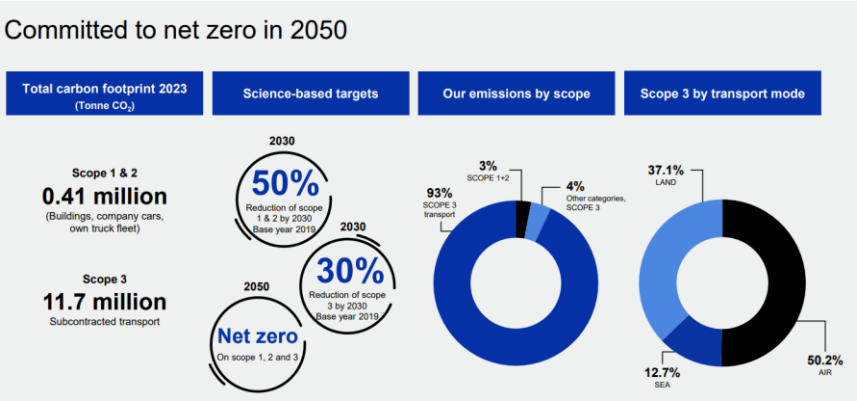


Figure 2.12 - Total carbon footprint in 2023 [14]

These targets include a 50% decrease in Scope 1 and 2 emissions by 2030, compared to the emissions recorded in 2019, and a 30% decrease in Scope 3 emissions by 2030. The company's objective is to attain complete elimination of emissions in all domains by the year 2050.

In 2023, DSV implemented several decarbonization initiatives, including approving science-based targets, implementing a certified Book & Claim process to reduce CO2 emissions for sustainable fuels, and developing renewable energy facilities, embarked on a carbon digitalization journey, invested in zero-emission

vehicle development projects, implemented supply chain optimization projects, and promoted sustainable business travel and warehouse practices (see Fig. 2.13) [6,14].

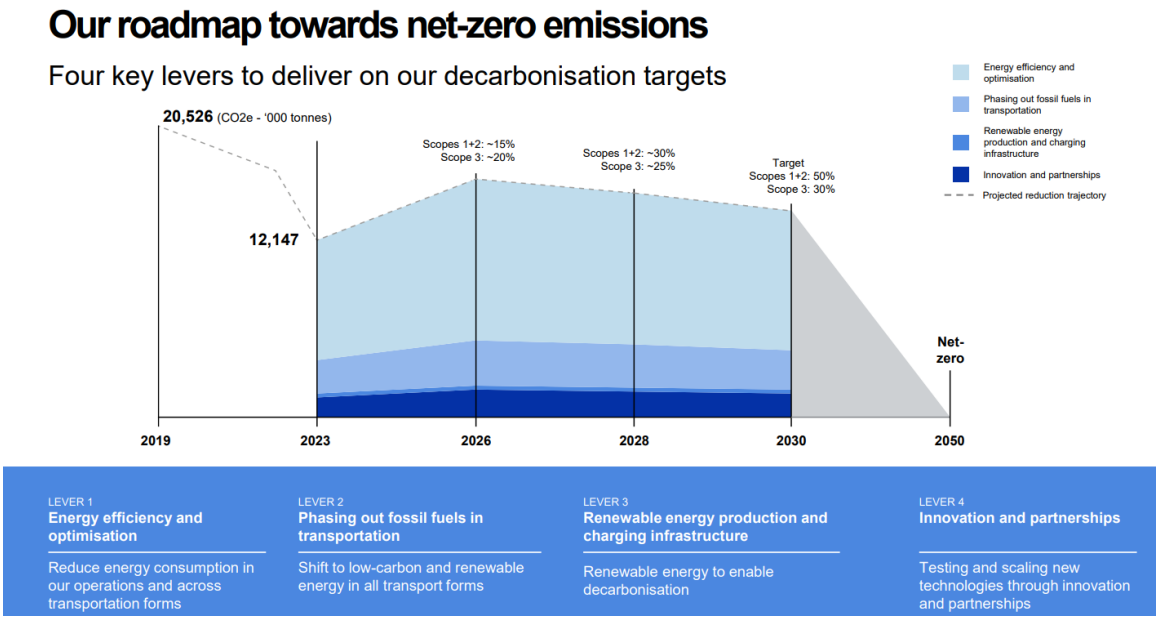


Figure 2.13 - Roadmap to zero emissions in DSV [14]

This diagram illustrates four essential mechanisms that may be utilized to accomplish decarbonization objectives: enhancing energy efficiency and optimization, eliminating the use of fossil fuels in transportation, implementing renewable energy sources and charging infrastructure, fostering innovation and forming collaborations.

DSV provides a variety of environmentally friendly logistics solutions that decrease the amount of carbon emissions produced by its customers' supply chains. These activities encompass CO2 reporting, supply chain optimization, the use of sustainable fuels, the establishment of sustainable warehouses, and the implementation of carbon offsets. DSV offers comprehensive statistics on greenhouse gas emissions categorized by Scope 1, 2, and 3, as well as by the specific mode of transportation. This enables us to monitor the advancement of objectives aimed at reducing emissions. The firm is affiliated with the Smart Freight Center and actively participates in its Clean Air Transport initiative, which aims to reduce carbon emissions in the aviation industry [14].

DSV's Green Logistics solutions include a variety of environmentally friendly technology and practices designed to minimize the environmental effects across the supply chain (see Fig. 2.14).

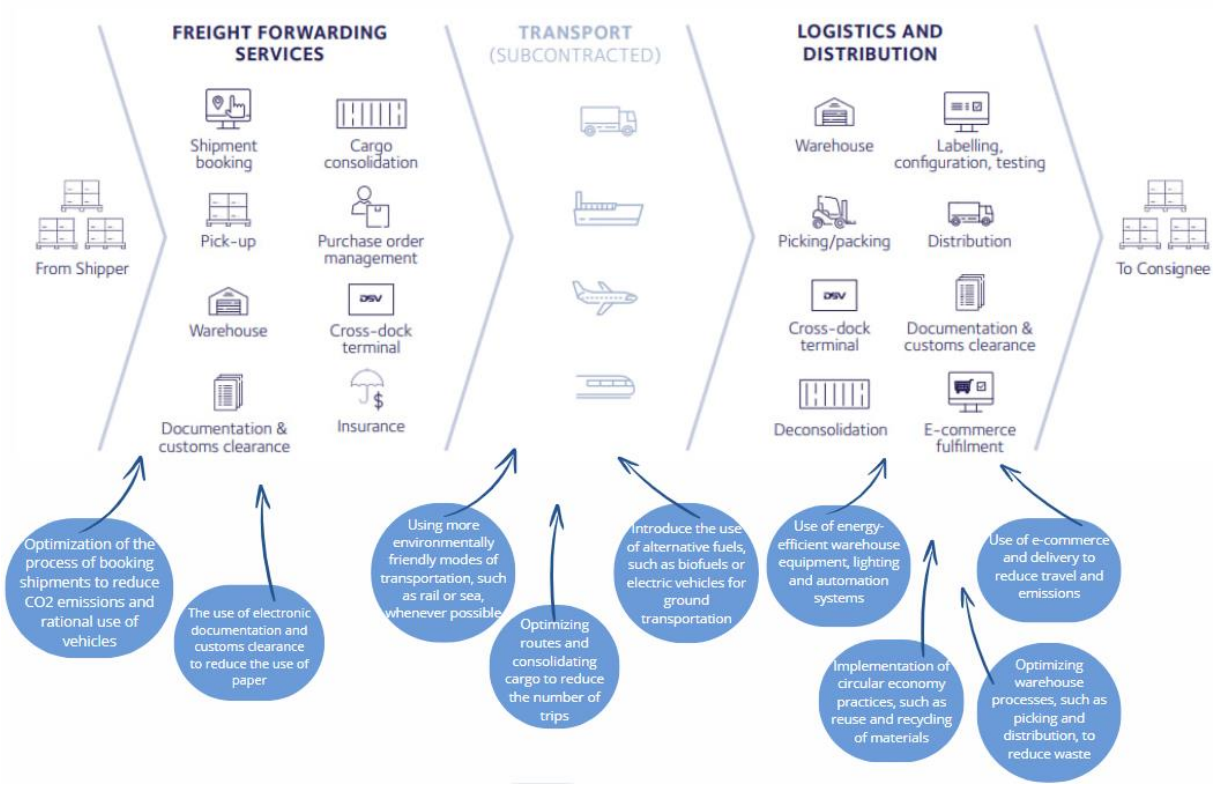


Figure 2.14 - Business processes in DSV's supply chain and implementation of various eco-technologies at different stages

Source: developed by the author

Figure 2.14 depicts the primary business procedures inside the supply chain, categorized into three main divisions: freight services, transportation, and logistics/distribution. Proposals are provided for the use of eco-technologies in each category to mitigate the adverse environmental effects.

Within the realm of freight services, the proposal is to optimize the booking process in order to efficiently utilize cars and minimize CO2 emissions. Additionally, the suggestion is to replace paper paperwork with electronic documentation to reduce paper usage.

When it comes to transportation, it is advisable to opt for eco-friendlier forms of transit, such as train or water, wherever feasible. Additionally, it is suggested to implement alternative fuels and electric cars for land transportation, along with optimizing routes and consolidating goods to minimize the frequency of journeys.

Energy-efficient warehouse equipment, lighting, and automation systems are suggested in the logistics and distribution business. Additionally, it is crucial to incorporate circular economy strategies, such as the utilization of materials by reusing and recycling. Efficiently optimizing the picking and distribution procedures will result in a reduction of waste. Ultimately, the utilization of e-commerce and delivery services can effectively diminish the need for travel and thereby decrease emissions.

Common approaches include implementing investments in renewable energy sources, such as solar panels, to provide electricity for facilities. Integration of waste management and recycling initiatives throughout all operational phases and utilization of environmental parameters in the selection of suppliers and partners [6,16].

Along the entire supply chain, these measures can aid in the reduction of greenhouse gas emissions, the conservation of energy and resources, and the promotion of more sustainable operations.

DSV actively analyzes cutting-edge technologies that enhance the efficiency and eco-friendliness of logistics. These encompass many cutting-edge technologies such as artificial intelligence, robots, the Internet of Things, blockchain, unmanned aerial vehicles, electric and hydrogen trucks, supply chain circuits, and other related advancements.

While the company's documents may not explicitly state it, DSV's emphasis on sustainability and decarbonization is likely to also apply to their customer service methods. DSV Logistics incorporates ecologically focused customer service methods, which encompass:

1. Providing clients with the opportunity to choose environmentally friendly transportation choices, such as rail, sea, or electric vehicles, for their goods. This has the potential to decrease the environmental impact caused by the delivery procedure.

2. Route optimization and consolidation: Employing sophisticated logistics planning and optimization techniques to combine shipments and devise the most effective routes, so minimizing the total distance traveled and the resulting emissions.

3. Implementing paperless procedures and utilizing digital documentation: By reducing reliance on paper-based records and encouraging the use of digital methods for customer contact, order management, and tracking, the environmental effect of paper usage may be significantly reduced.

4. Promoting the use of sustainable packaging and materials handling practices, which involve the utilization of environmentally friendly packaging materials, recycled materials, and efficient materials handling procedures. The aim is to reduce waste generation and encourage recycling.

5. Carbon offset schemes allow customers to counterbalance the carbon emissions linked to their shipments by either supporting environmental initiatives or investing in carbon credits.

6. Implementing energy-efficient techniques, utilizing renewable energy sources, and implementing waste management measures in storage and distribution facilities to minimize the environmental effect of operations.

DSV's sustainability strategy and activities exhibit a resolute dedication to incorporating environmental factors into its operations, including customer service. DSV offers customers eco-friendly logistics solutions and the means to evaluate and decrease their carbon emissions, enabling them to attain their environmental objectives while minimizing their ecological imprint.

2.4 Chapter 2 summary

The analysis of the business portfolio of the logistics company DSV carried out in the analytical section of the qualification work, revealed that the company is one of the world's leading freight forwarders. The company`s strategy is keeping supply

chains flowing in a world of change, acknowledging their role as part of the global infrastructure enabling world trade. The business model of the company is flexible and asset-light, which helps to keep supply chains flowing efficiently, from shipper to consignee.

Diagnostics of the financial and economic activity of the Ukrainian division of the DSV company based on the analysis of assets, liabilities and capital, as well as indicators of liquidity, financial stability and business activity, showed that the financial condition of the company remains stable in general, which, given the conditions of martial law in Ukraine, is a positive trend. The company is found to have a comprehensive sustainability strategy that addresses environmental, social and governance elements. Considerable attention is paid to the process of decarbonization and reduction of emissions in logistics operations. DSV has set aggressive targets for reducing greenhouse gas emissions by 2030 and 2050.

The company makes significant investments in renewable energy sources, alternative fuels, route optimization and other environmental technologies, and provides consumers with a number of environmentally friendly logistics solutions, such as carbon accounting, neutralization of emissions and optimization of the supply chain. Therefore, the environmental aspect is a key element of DSV's customer service procedure. The organization strives to provide quality logistics services, minimizing the negative impact on the environment.

CHAPTER 3
PROJECT PROPOSALS FOR IMPROVING PLANNING AN ENVIRONMENTALLY ORIENTED CUSTOMER SERVICE PROCESS OF A LOGISTICS COMPANY

3.1 Formation of a model for planning an environmentally oriented customer service process of DSV company

Sustainable operations are becoming more important in today's fast-paced world, and environmentally friendly technologies are having a big impact in many different industries.

The integration of green tech efforts, such as carbon-neutral manufacturing, renewable energy sources, and novel recycling techniques to reduce electronic waste, must now be prioritized within dynamic digital supply chains. Businesses are now required to include sustainability into their core strategy through eco-friendly technical advances due to the rising expectations from informed customers and tight regulatory limitations.

Leading logistics companies act as pioneers who shape the development trends not only of their own company but also the development trends of the entire logistics industry. One such organization is DSV, a logistics company that makes extensive use of advanced technologies, especially environmentally friendly ones, to improve customer service processes. The growing importance of environmentally-oriented technologies in today's world requires studying their impact on supply chain management and planning, as well as appropriate adjustments. Therefore, there is a need to introduce a system approach to the environmentally oriented customer service process of the company, which forms an end-to-end vision of the use of green technologies to ensure logistics service processes [35].

The proposed model of environmentally oriented planning of customer service processes (see Figure 3.1) determines an intricate logistics process in the company that encompasses several phases of the transportation of products from the source to the ultimate receiver. The upper section illustrates the overall sequence of stages: planning, inbound (transportation to the warehouse), storage, outbound (distribution), and delivery to the destination. Each stage includes a comprehensive account of the specific processes involved, including cargo pickup, customs clearance, warehousing, order picking, and ultimate delivery to the consumer.

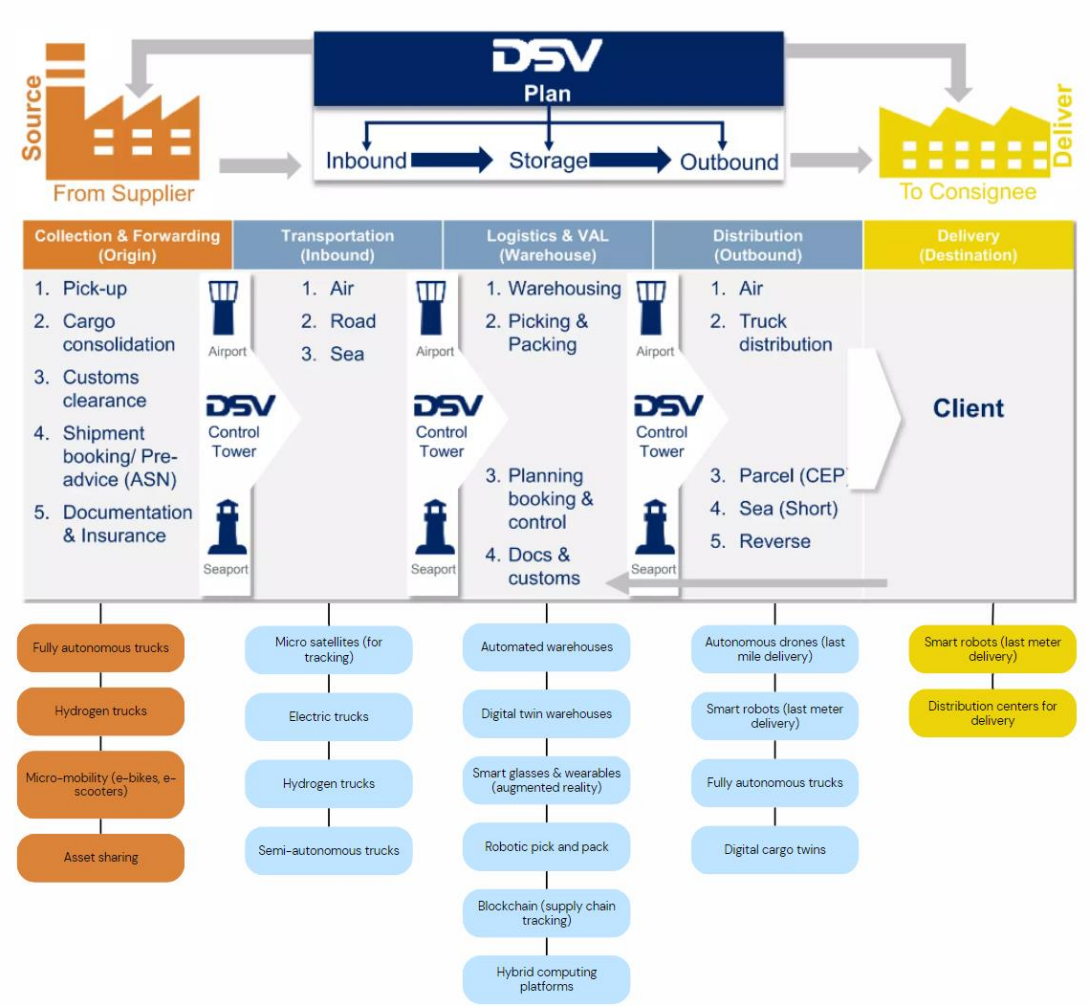


Figure 3.1 - Model of environmentally oriented planning of customer service processes for DSV company

Source: compiled according to the data [14,59]

Furthermore, the figure 3.1 illustrates a range of cutting-edge and environmentally sustainable technologies that may be implemented at every level of the logistics chain to enhance both the efficiency and ecological compatibility of the operations.

Transportation services include completely autonomous and hydrogen-powered trucks, and electric cars, as well as asset-sharing and micromobility solutions. Warehouses can employ automated and digital replica warehouses, robotic picking systems, augmented reality technology, blockchain for tracking purposes, and hybrid computing platforms.

The ultimate goal is to develop autonomous drones, intelligent delivery robots, and completely automated vehicles for delivery. Advanced technologies, including microsatellites, are also demonstrated to track and monitor at every level.

Proposed model provides a comprehensive view of the logistics and distribution process for DSV. The process outlined covers the various stages involved in managing the flow of goods, from receiving them from suppliers to storing them, distributing them, and ultimately delivering them to the intended recipient.

The fundamental process flow is illustrated above, showcasing the input, storage, and output steps. Specific activities are listed under each step, including pickup, customs clearance, warehousing, and various methods of transportation for final delivery, such as air, truck, and parcel service.

The process starts with the initial phase of In-bound (inbound logistics), which involves the gathering and transportation of goods from suppliers. During this stage, various operations are carried out, including cargo selection, consolidation, customs clearance, shipment booking, and insurance.

Next comes the Storage stage, where the focus is on showcasing a warehouse for the temporary storage of goods.

The Outbound stage of the supply chain focuses on the distribution and shipment of goods to customers. This is where the process of loading vehicles, planning routes, and maintaining control occurs.

The last step involves delivering the goods to the final recipient through different methods such as air transportation, road transport, or courier service.

Furthermore, the scheme showcases the potential for integrating cutting-edge environmental technologies throughout different stages of the logistics chain, in addition to the primary operations. Specifically, the text emphasizes the importance of incorporating innovative technologies and environmentally-friendly solutions throughout the entire logistics process. Some of the areas that can be explored further are fully autonomous trucks, hydrogen/electric trucks, micro-mobility solutions, automated warehouses, drones for last-mile delivery, smart robots, digital twins, blockchain for supply chain tracking, and hybrid computing platforms.

The description highlights the importance of careful planning in effectively managing customer service processes. The model presented here seeks to explore the integration of sustainable solutions into various stages of the customer service process, with the goal of enhancing operational processes through the implementation of suitable green technologies.

Thus, this model provides a comprehensive reflection of the modern logistics process, incorporating promising environmental solutions to enhance efficiency, sustainability, and the quality of customer service.

This plan showcases how the integration of cutting-edge digital and eco-friendly technology may revolutionize conventional logistical operations, resulting in a remarkably efficient and ecologically sustainable supply chain. When considering an environmentally oriented service process, it is crucial to consider the use of eco-friendly technologies that can be incorporated at different stages of the logistics process (see Figure 3.2).

DSV's scalable digital platforms successfully handled almost 270 million tasks, deliveries, and order lines last year. These systems and technologies played a crucial role in the company's operations. Aligned with the goal of expansion, this digital infrastructure not only enables efficient operations but also enhances the integration of mergers and acquisitions in a timely way. DSV employs a hybrid computing solution that integrates on-premises and cloud technology [1].

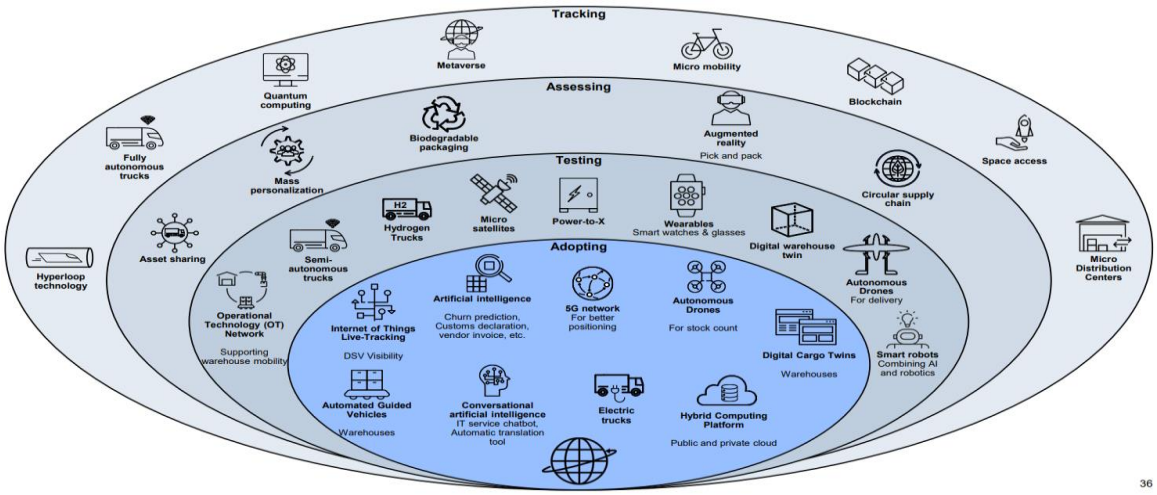


Figure 3.2 - Scheme of technologies and their levels of implementation in the company [25]

With a clear focus on goals and strategies, the company effectively utilizes its investments in technology development, leading to overall improvement and competitive advantages. For instance:

1. Maximizing cost efficiency. Green technologies can help improve operational efficiency, resulting in long-term cost savings.

2. Enhanced Reputation and Expanded Market Share – As consumers become more conscious of the environmental impact of the brands they support, companies that actively participate in eco-friendly initiatives could gain significant market favor and propel their success.

3. Being prepared for the future is crucial in a constantly changing global regulatory landscape. By staying ahead of the curve and embracing new regulations early on, you can minimize any potential disruptions.

4. Catalyst for Innovation – A strong emphasis on the environment can inspire other creative endeavors, resulting in improved methods for providing products and services that were not previously explored.

Despite the optimistic appearance of this landscape, it would be unwise to overlook the possible challenges that lie ahead.

The shift towards more environmentally friendly alternatives can present certain challenges, resulting in several potential risks:

1) Investment Costs: Transition may involve a substantial initial investment, often necessitating significant changes to current systems.

2) Technological complexity: Frequently, the transition entails intricate operations that necessitate specialized expertise that can be challenging to identify and acquire.

3) Potential for Failure: Just like any new system, there is always a possibility of encountering challenges, whether it is related to integration issues or falling short of expectations.

4) Uncertainty surrounding regulations. Similar to a financial advisor, firms aim to adhere to existing legislation. However, the presence of uncertain future changes poses considerable risks that can negatively impact ROI calculations.

DSV prioritizes supply chain insight and uses digital technology to improve communication with suppliers and consumers. Their digital freight forwarding platform, myDSV, manages bookings, tracking, claims, and reporting. In 2022, bookings on the platform increased significantly, highlighting its importance in optimizing corporate processes. DSV adopts a proactive approach, closely monitoring industry trends and adopting new technology to benefit both the firm and its clients. They use direct customer connectors, replacing traditional EDI connections with advanced API interfaces, demonstrating their commitment to technological advancements [4].

The incorporation of "green" technology in the operations of a logistics provider is crucial in meeting the demands of sustainable development and ethical business practices. Logistics, being a crucial element of the global economic system, necessitates the efficient utilization of resources and enhancement of procedures to minimize the adverse effects on the environment.

Based on the examined data and the company's objectives, we propose investing in the advancement of environmentally-friendly green technologies that align with the company's future projections and address the issue at hand. One such technology is Power-to-X, which has an impact on the whole supply chain and is ecologically sustainable, a crucial factor for customers (see Figure 3.3) [3,25,26].

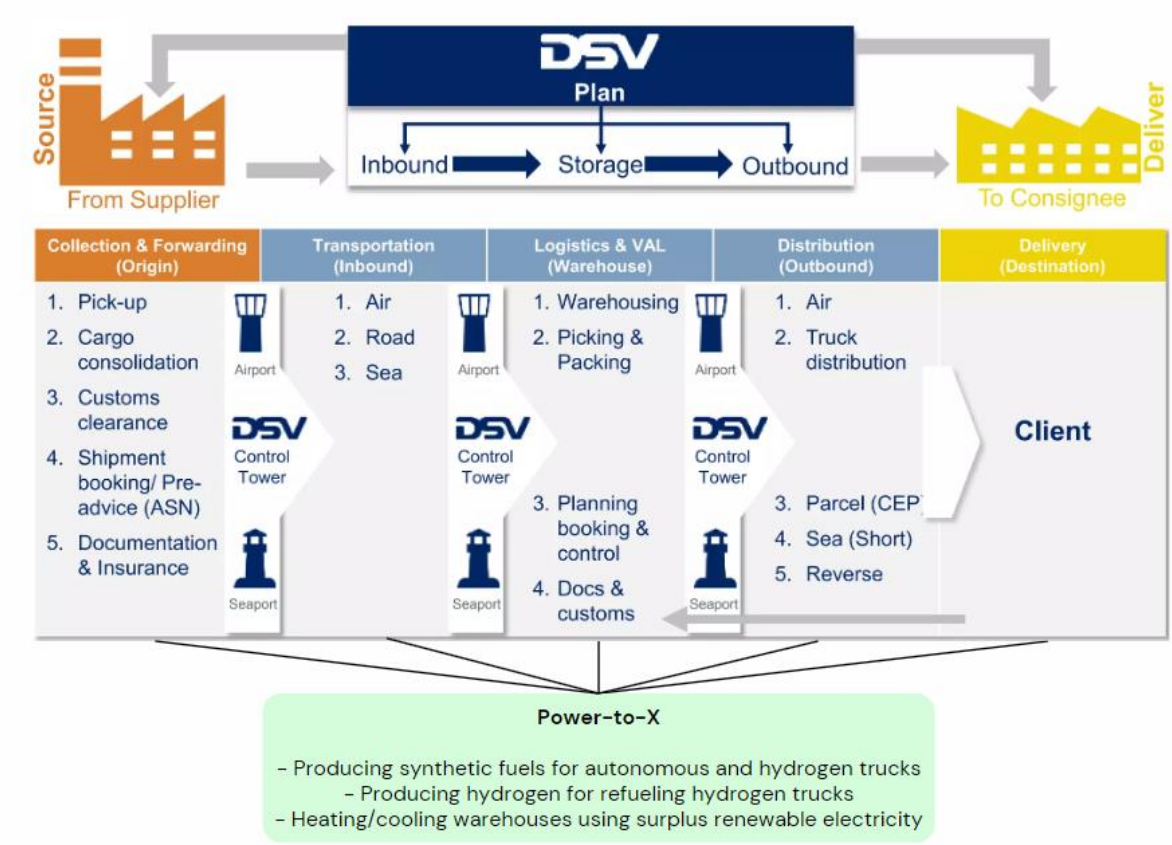


Figure 3.3 - DSV's logistics flow with the "Power-to-X" concept

Source: compiled according to the data [59,36]

Figure 3.4 illustrates the technological process, but it is important to observe the operational aspects depicted in the picture as well.

Given this information, it would be wise to create a project (plan) for integrating technology into the planning of an environmentally-focused customer service process for a logistics company.

The main goal is to develop a comprehensive strategy for using environmentally friendly technology in logistics operations, with the aim of enhancing efficiency and competitiveness in the market.

The objective is to formulate a comprehensive plan to integrate eco-friendly technology into every stage of the logistics process. The primary objective is to establish a plan for the advancement of environmentally friendly logistics infrastructure with the aim of enhancing the efficiency of transportation, storage, and processing of products and services. The project entails the incorporation of cutting-

edge technology and efficient methodologies to guarantee the long-term growth and viability of the logistics provider.

The goal is to evaluate the environmental impact of current logistical procedures, identify ways to reduce emissions and improve energy efficiency, develop recommendations for environmentally friendly technologies in transportation and warehousing, and create a comprehensive financial strategy to identify resources and funding sources for new technology implementation.

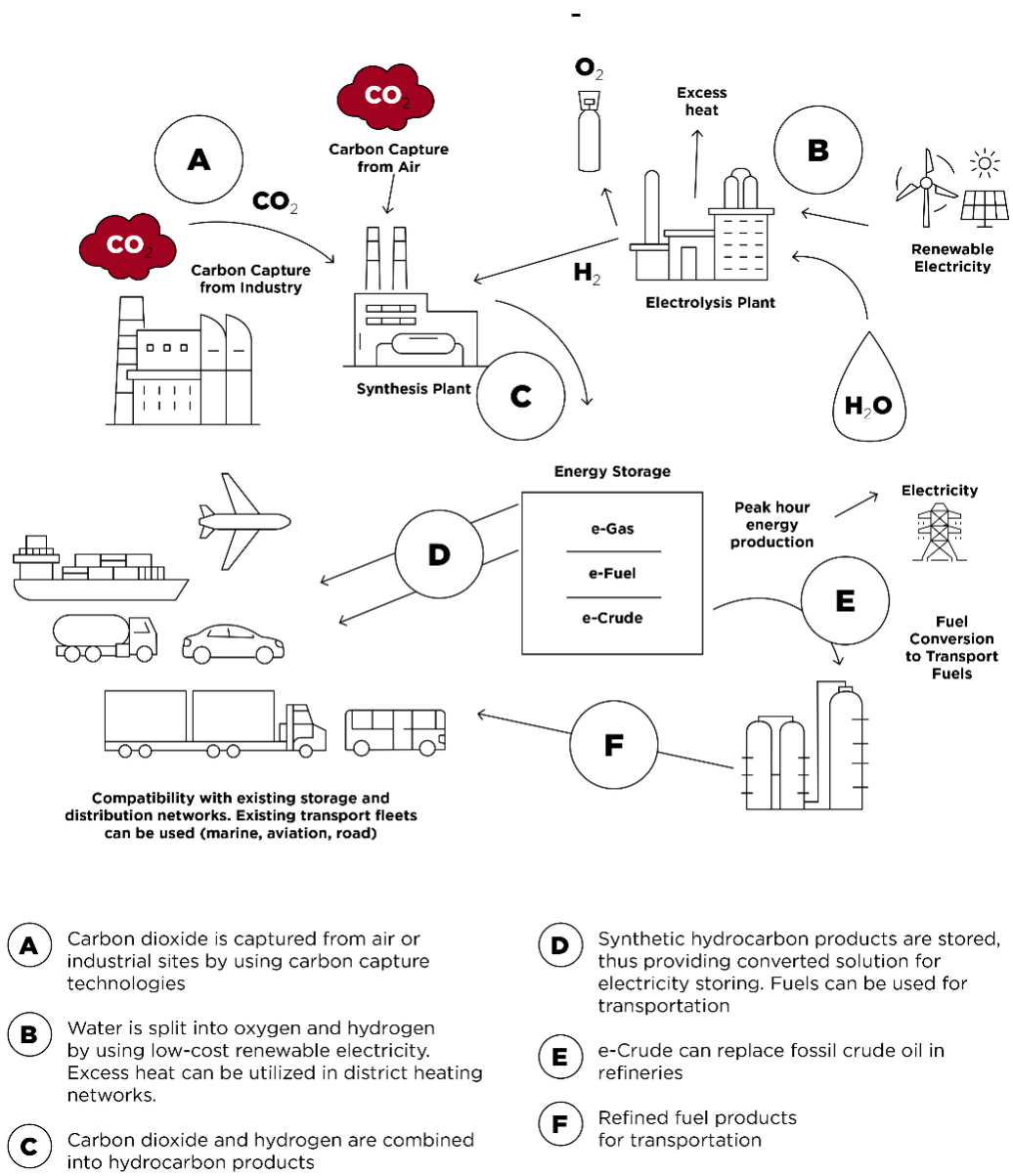


Figure 3.4 - Power-to-X process [32]

The primary issue is the inadequate development of environmentally friendly logistical infrastructure, resulting in excessive resource consumption and detrimental effects on the environment. The implementation of "green" technology will enable the reduction of emissions, optimization of resource utilization, and establishment of a sustainable logistics infrastructure that aligns with contemporary environmental requirements. Upon project completion, it is anticipated that the logistics provider's competitiveness will be enhanced, the adverse environmental effects will be reduced, and the increasing societal need for sustainable development will be met.

Moreover, an essential element in leading global innovation projects is DSV's Innovation Hub. This dedicated team monitors developing trends and technologies, collaborates with both internal and external stakeholders, verifies concepts, develops financial business cases, and oversees projects across the network, guaranteeing that DSV maintains a leading position in industry advancements.

The project's significance to the DSV company's development of logistics infrastructure facilities may also be confirmed thanks to the technical industry study [4]. Additionally, this is impacted by the subsequent factors:

1. Increasing focus on environmental issues. Global concern over climate change and environmental degradation has led to a surge in the need for environmentally friendly goods and services.

2. Regulatory obligations in several nations mandate companies to minimize their environmental footprint, encouraging logistics operators to adopt green solutions.

3. Financial benefits. "Green" technology can provide logistics providers with several economic advantages, including:

- Decreased energy and fuel expenses
- Decreased emissions of hazardous substances
- Enhancement of the company's reputation.

4. Efficiency and optimization of processes may be achieved by implementing "green" technology, such as autonomous flying drones and guided vehicles. These technologies play a crucial role in improving delivery and warehouse operations, particularly for logistics organizations.

5. DSV is transforming its operations by integrating artificial intelligence and digital platforms, aiming to boost productivity and streamline mergers and acquisitions, thereby significantly transforming logistical procedures.

6. Enhance supply chain visibility: Employing digital technology to establish communication with suppliers and consumers at every stage of the delivery process may enhance supply chain visibility, a crucial aspect in the contemporary world.

Using a SWOT analysis (analysis of opportunities, threats, strengths, and weaknesses) identified the most important factors to consider in the planning, design, and implementation of a logistics infrastructure development in this part (see Table 3.1).

Table 3.1 - Analysis of strengths and weaknesses of the project

Strengths	Weaknesses
1. Growing demand for "green" products and services. 2. Legal requirements for reducing the impact on the environment. 3. Economic advantages of "green" technologies. 4. DSV's experience in innovation. A significant number of digital platforms and technologies are already in use in the company. 5. A strong emphasis on the strategic application of artificial intelligence to improve efficiency. 6. High visibility of the supply chain and the use of digital technologies to communicate with partners. 7. Technical or cyber-attacks can put digital systems and data at risk.	1. Dependence on digital technologies can create vulnerabilities in the event of technical problems or cyber-attacks. 2. The risk of non-acceptance or non-adaptation of employees to new technologies. 3. The need for significant investments and resources for the introduction of new "green" technologies.
Opportunities	**Threats**
1. Expanding the use of "green" technologies can increase environmental responsibility and competitiveness. 2. Cost reduction 3. Active innovation activities and the DSV Innovation Center allow us to stay at the forefront of the industry. 4. Improving the company's image	1. The possibility of changes in legislation or regulatory requirements regarding the use of environmental technologies. 2. Competition and pressure to reduce costs can become an obstacle to the effective adoption of new technologies. 3. Unforeseen technological risks

Source: developed by the author

The SWOT analysis findings indicate that the integration of "green" technology into the operations of logistics provider DSV has identified numerous strengths that

may be effectively applied. An optimal setting for successful implementation is established by the increasing demand for eco-friendly products and services, legislative mandates to reduce environmental impact, and the financial benefits of green technology. Moreover, DSV's history of pioneering advancements, namely in the use of digital platforms and artificial intelligence, demonstrates its willingness to embrace technological progress. Nevertheless, it is necessary to take into account the shortcomings of the project. To enhance the success of an endeavor, it is important to take into account these aspects in both the planning and execution stages. With its strengths and future prospects, the project has the capacity to establish dominance in the logistics and logistics infrastructure industry. Nevertheless, it is crucial to anticipate and be ready for any possible obstacles that can occur.

The product developed for the DSV company is the implementation of "Power-to-X" technologies in the activities of the logistics provider, which will allow the use of excess electricity obtained in periods of excess production of fluctuating renewable energy sources over consumption. This is considering the use of "Power-to-X" conversion technologies, where electrical energy can be converted into different forms of energy that can be used in different sectors, such as transport or the chemical industry.

Power-to-X conversion technologies enable the decoupling of electricity generation from other sectors for use in other sectors (like transportation), potentially with the help of additional generation investments. A crucial component of the green transition is power-to-X. Fossil fuels can often be directly replaced by electricity, as in the case of electric cars and electric heat pumps for heating [26].

This is aimed at creating opportunities for decentralization of energy from the electric power industry to other sectors, contributing to the reduction of emissions, increasing the efficiency of the use of resources and increasing competitiveness in the context of the logistics market.

These is including research into potential ways of using energy, development of Power-to-X concepts, investment planning, and implementation and testing of selected technologies (see Appendix E). This will enable the logistics provider to operate more

efficiently and sustainably, reducing environmental impact and providing alternative energy sources for its operations.

Based on this decomposition, we determined a certain relationship between the works and noted the number of workers and the time each stage will take, this will allow us to study and manage the plan implementation process in more detail. This relationship will also be noted in next table, which will allow us to effectively track the sequence and interaction between individual tasks and phases of the project (see Appendix F).

This approach will help to ensure greater structure and management of the process, contributing to the successful completion of tasks and achievement of the set goals of the project.

This approach will help to ensure the timely and successful completion of all stages of the warehouse logistics improvement project.

Therefore, a detailed development of the steps and processes necessary for the implementation of "green" technologies in the activities of the logistics provider DSV was carried out. Starting with the analysis of bottlenecks and ending with the implementation of Power-to-X technology, the project was clearly structured and covered all the necessary aspects.

The designed grid schedule will become an important tool for effective management and control of the completion of tasks within the specified time. The total duration of the project, which is 4 years, ensures the achievement of the strategic goals of the company in the field of logistics.

Logistics projects are complex tasks that require a balanced and systematic approach to planning and execution. In this section, a key tool for determining the sequence and duration of work will be considered - the logistics project implementation plan. Construction of the work schedule and Gantt resource charts is a necessary stage for effective control over the progress of the project, allocation of resources and timely detection of possible delays. This graph is built based on appendix F and is displayed in appendix J, figure J.1-3.

The total project implementation period will be 4 years, starting on December 21, 2020, and ending on May 7, 2026. This timeline takes into account all stages, including analysis, market research, supplier selection, signing of agreements with Power-to-X technology developers, as well as stages of risk management, documentation, financing, ordering equipment and materials, construction, testing and implementation of systems. With such a clear project schedule, the company will be able to effectively implement new technologies and timely achieve the set goals for improving warehouse logistics.

The Gantt chart for the logistics project reflects the sequence and duration of works on the implementation of "green" technologies. The project begins with a preparatory phase, including the definition of strategic goals for the implementation of "green" technologies, market analysis and agreements with Power-to-X developers. Further, in the following weeks, tasks related to risk management, development of technical documentation, approval of plans and specifications, as well as verification and optimization of the territorial plan for the placement of energy equipment are carried out. After the implementation of the systems, an important stage is the monitoring and correction of work in real time, performance analysis, correction of shortcomings and optimization of processes. This phase includes commissioning the Power-to-X system, setting up the performance and environmental monitoring system, as well as regular maintenance and identifying opportunities for further improvement. The project ends with a final analysis of the results and determination of further steps to ensure the sustainable and efficient use of "green" technologies in the company's logistics operations. After the implementation of the systems, an important stage is the monitoring and correction of work in real time, performance analysis, correction of shortcomings and optimization of processes. The completion of the project is scheduled for May 7, 2026.

The resulting table makes it possible to estimate the distribution of resources (workers) for each task in the project and to identify possible overstrains or deficiencies in the distribution of tasks and work among workers. The main goal is to ensure the

balance of resource utilization and the optimal distribution of tasks among employees for the efficient completion of the project.

Logistics projects are challenging and important tasks for any organization aimed at ensuring the efficiency and optimization of the supply chain. Successful implementation of a logistics project requires not only technical knowledge and processes, but also management skills, communication effectiveness and close cooperation between team members.

To implement a logistics project for the development of logistics infrastructure facilities, the company forms a project team that includes key specialists from various fields. In particular, the CEO is responsible for the overall management and strategic vision of the project. The CTO is responsible for the technical part and infrastructure. The analyst provides data analysis and informed decision-making.

The risk manager is responsible for identifying and managing risks that may arise during the project. The executive director coordinates the work of all departments and interacts with other team members to achieve the project goal. The manager is responsible for specific tasks and managing their implementation. The CFO manages the financial side of the project and ensures optimal use of resources.

The complexity of logistics projects requires a high level of coordination and cooperation among all team members to ensure successful implementation and achievement of the organization’s business goals. Each team member plays a key role in ensuring full project coverage, and their efforts are based on the principles of effective cooperation and mutual information exchange. The process of technology implementation is complex and involves multiple challenges. This process requires detailed planning, high coordination and effective cooperation of various experts and specialists.

The project team under analysis consists of various professionals with unique skills and competencies in various areas, from audit and technical inventory survey to financial analysis and technical consulting. The key competencies that team members should possess are summarized in Table 3.2. This diverse range of expertise allows for

the implementation of a warehouse automation system at all stages of the project, from needs analysis to financial planning and technical support.

Table 3.2 - Evaluation of the economic efficiency of providing customer service processes of a logistics company with environmentally-oriented technologies

Position	Competences
General director	Strategic management, leadership qualities, strategic vision.
Technical director	Technical expertise, development, and implementation of technical concepts.
Analyst	Analytical skills, data processing, making informed decisions.
Risk manager	Risk management, identification and analysis of potential threats.
Executive Director	Coordination and interaction between all units, achievement of goals.
Manager	Task management, interaction with the team, achieving results.
Financial Director	Financial examination, management of project financial indicators.

Source: developed by the author

This table provides an overview of the key competencies required for effective project team members. Each specialist has unique skills and qualifications that complement and ensure the successful implementation of a logistics project.

It is important to note that the successful completion of each stage of the project and the interaction of all team members is crucial to achieving the overall goal of implementing effective warehouse automation systems. Interaction between the various stages, including market analysis, vendor selection, implementation, and operational monitoring, is a key factor in the success of the project.

In addition to technical aspects, it is also important to note the importance of effective communication within the team and with stakeholders. Clear communication helps to avoid misunderstandings, resolve conflicts, and ensures a common understanding of the project's goals and objectives.

According to the data of table 3.2, it can be concluded that the employment of workers in the company is quite uniform. This means that the company does not overstress its employees and has sufficient resources to complete its tasks (Figure 3.3).

For example, tasks related to market analysis ("Market analysis of 'green' technologies and Power-to-X") and signing agreements ("Signing an agreement with

Power-to-X technology developers") require the participation of the general director and the manager with the executive directorate. However, in some cases, the work can be divided between several employees, as it happens in the case of the development of a financial plan ("Development of a financial plan"), where the financial director and the manager are involved. In general, the level of employment of workers in the company is good and not a cause for concern. However, companies should carefully monitor this indicator to avoid overstretching or underutilizing resources.

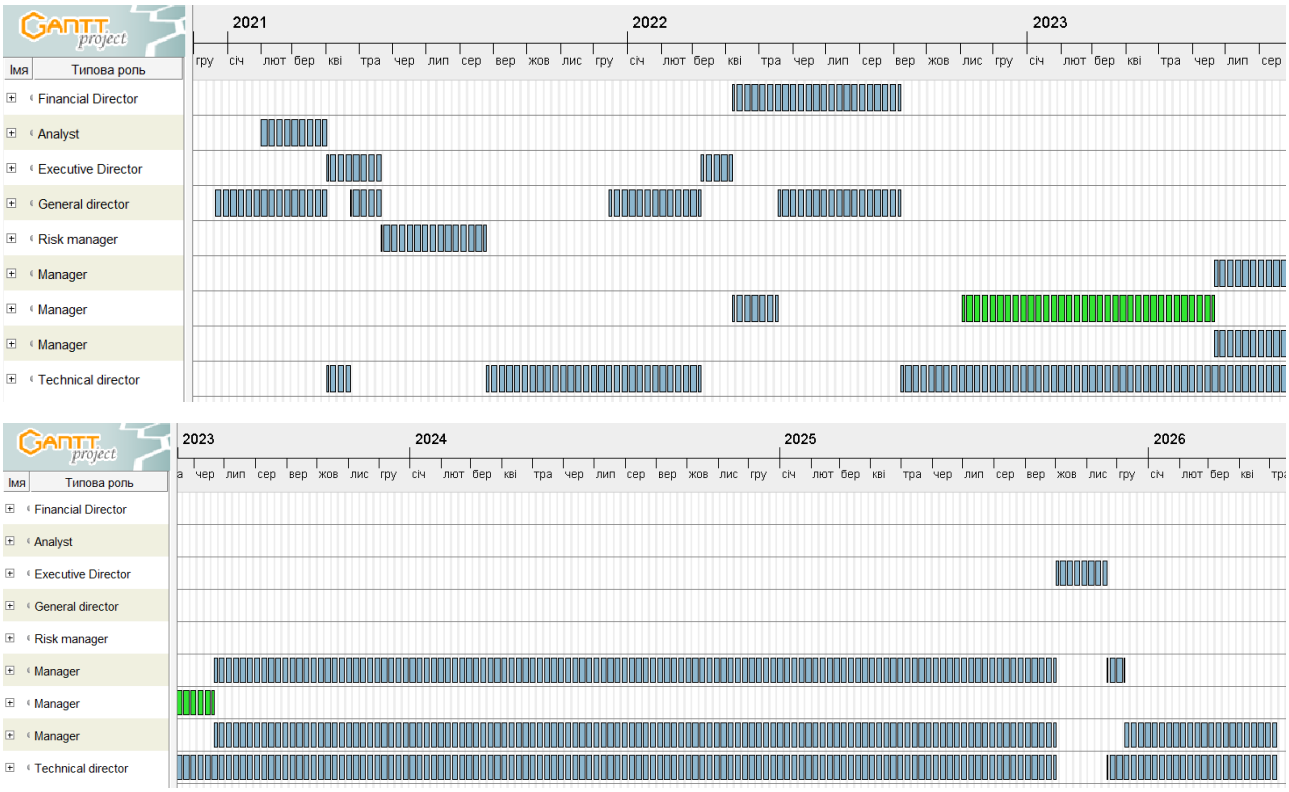


Figure 3.3 - Employment of resources during the implementation of the project of implementation of "green" technologies in the activity

Source: developed by the author

Here are some suggestions for overseeing employees' employment within the company: examine employment data for employees on a regular basis to spot possible problems; distribute the workload evenly among staff members to prevent overwork; help staff members advance their skills so they can carry out their responsibilities with efficiency; provide enough workers to complete the tasks assigned by the business.

In general, to prevent possible overstrains and ensure optimal use of resources, it is worth considering the possibility of dividing tasks between workers or reviewing the workload of individual employees to ensure efficient progress of the project.

An environmentally friendly customer service concept for DSV Logistics. The model shows how environmentally friendly solutions can be integrated across the logistics system, from planning to delivery. The "Power-to-X" technology could transform excess renewable electricity into logistics and transport energy. This will lower DSV emissions and boost energy efficiency.

Environmental technology implementation project SWOT analysis shows strengths (increasing demand, legislative requirements, economic benefits) and threats and weaknesses (costs, technological challenges, regulatory uncertainties).

An extensive project implementation plan with a Gantt chart covers market analysis to system execution. The project lasts 4 years. After that, the project team's fundamental capabilities for each stage's success are identified.

This is a complete strategy to developing and implementing environmentally friendly technology in the company's logistics operation to boost efficiency and competitiveness.

3.2 Evaluation of the economic efficiency of providing customer service processes of a logistics company with environmentally-oriented technologies

The budget plan is a strategic tool that determines the distribution of resources and financial needs necessary for the performance of tasks and the achievement of set goals. Special attention will be paid to important aspects of the budget process to ensure a balanced and rational allocation of resources to achieve success in each stage of project implementation.

The introduction of green technologies, such as Power-to-X, into DSVs' operations has the potential to bring significant benefits and positive changes in various

aspects of their operations. One of the key benefits is the reduction of the carbon footprint and the promotion of sustainable development, which is in line with the current requirements of environmental responsibility.

Power to X (PtX) refers to a collection of technologies that convert electrical power from renewable sources like wind, water, or solar into other energy carriers or chemicals. It provides a way to store renewable energy in the form of gases, liquids, or chemicals when production exceeds demand. These can then be used in the transport, industrial, or building sectors. This technology is crucial for decarbonization and can be used for efficient utilization of variable energy sources [34,36].

Common Power to X pathways include:

1. Hydrogen power: Using electrolysis to split water into hydrogen and oxygen, using renewable electricity. The hydrogen can then be used for transport, industry, or electricity generation.
2. Power to methane: Combining hydrogen from electrolysis with carbon dioxide to generate methane through a methanation process. The methane can substitute natural gas.
3. Power to liquids: Converting hydrogen and carbon dioxide into liquid synthetic fuels like methanol, diesel, and kerosene using a Fischer-Tropsch process
4. Power to ammonia: Using hydrogen from electrolysis and nitrogen to generate ammonia, which is used for fertilizer and potentially fuel [34].

Power to X can help integrate more renewables into the energy system by giving them more flexibility and uses for excess electricity. It creates a linkage between sectors like electricity, transport and industry.

Challenges for Power to X include high costs currently, needing more renewable energy to produce the hydrogen/other fuels, and developing storage and distribution infrastructure. But costs are expected to fall as the technologies mature.

The technology has the potential to revolutionize the industry by providing a sustainable alternative to fossil fuels. It's part of a broader effort to reduce CO2 emissions and combat climate change [25,34].

First of all, the use of Power-to-X will allow DSVs to efficiently convert and use green energy for their logistics processes. This will lead to significant emission reductions and limit the use of traditional energy sources, helping to conserve natural resources and reduce the negative impact on the environment.

In addition, the implementation of Power-to-X can improve DSVs' operational efficiency by providing a stable and reliable source of green energy for their logistics systems. This will allow the company to reduce energy costs and increase the resilience of their operations to market changes.

Based on the above, there are several interesting options for using Power to X (PtX) technologies in transport and logistics:

Producing renewable hydrogen via electrolysis to power hydrogen fuel cell vehicles for zero-emission transport. This includes hydrogen to power trucks, trains, ships, and airplanes. The renewable hydrogen used as fuel would be produced using solar or wind power.

Generating renewable synthetic fuels like methane, diesel, ethanol, or methanol that can directly replace fossil fuels for transportation. Power to liquid technologies can convert renewable hydrogen and captured carbon dioxide into liquid fuels compatible with existing engines and infrastructure. This provides a path to decarbonize aviation, shipping and long-haul trucking.

Using renewable hydrogen to assist in producing renewable ammonia that can be used directly as a fuel in some applications like maritime transport, electricity generation and high-temperature industrial furnaces. Ammonia is easier to transport than pure hydrogen.

Providing renewable power for producing, storing and transporting goods in ports, warehouses and distribution centers. Excess solar and wind electricity can be routed to produce green hydrogen or charged battery storage to power electric vehicle fleets and cargo handling equipment.

Allowing better integration of renewable energy into electric power grids that provide electricity throughout logistics networks. Excess renewable power can go to PtX products like hydrogen instead of being curtailed, supporting decarbonization [36].

With the innovative Power-to-X technology, DSV can also improve its relationships with customers and partners, as many companies and consumers increasingly prefer sustainable and environmentally friendly partners. This can open up new markets and create a competitive advantage for DSVs, signaling their willingness to adapt to modern environmental requirements and regulations.

In summary, Power to X gives logistics companies pathways to adopt renewable fuels for their vehicles and transport operations, while also benefiting electricity grids. It can help enable deep decarbonization of the logistics sector. Overall, the introduction of green technologies, including Power-to-X, into DSV's operations is seen not only as a strategic step towards energy efficiency and sustainable development but also as an innovative opportunity to ensure a positive impact on the environment and to remain competitive in the modern business environment.

Let's estimate the cost of general works of the logistics project for the implementation of "green" technologies (Table 3.3).

This table reflects the estimated cost of each phase of the project, including the various types of costs and resources required for successful implementation. The cost of this project in 530,000 euros is determined by the scope and complexity of the work required for the implementation of "green" technologies - Power-to-X.

The project covers a large number of processes, from the preparatory stage to the operational stage of the Power-to-X system. in. Costs also cover the acquisition and setup of hardware, software, and infrastructure to support new technologies. The cost calculation takes into account the number of specialists, resources, and costs for the necessary materials. The total cost reflects the investment in improving business processes and increasing productivity, making the project an important strategic initiative for the company.

Table 3.3 -Estimate of the logistics project

Task code	Task Name	Total cost
1	Preparatory stage	thousands, EUR
1.1	Determination of strategic goals for the introduction of "green" technologies in logistics activities	5031
1.2	Market analysis of "green" technologies and Power-to-X	1236
1.3	Determining the amounts and types of energy that can be converted using Power-to-X	4556
1.4	Signing an agreement with Power-to-X technology developers	4983
2	Risk and security management	
2.1	Identification of potential risks associated with the implementation of Power-to-X.	1500
2.2	Development and implementation of a risk management plan.	4737
3	Documentation and approval	
3.1	Development of technical documentation for Power-to-X implementation	4939
3.2	Approval of plans and specifications using "green" technologies	3955
3.3	Review and approval of the territory plan for the placement of energy equipment	757
4	Financing and Investments	
4.1	Development of a financial plan	1899
4.2	Financial approval of the project and obtaining the necessary funds for implementation	2563
5	Ordering equipment and materials	
5.1	Creation of copies of technical plans and specifications	536
5.2	Choice of technology and suppliers	436
5.3	Ordering the necessary equipment for energy conversion using Power-to-X technology	2527
6	Construction stage	
6.1	Development of the work schedule and determination of rates for construction	3925
6.2	Obtaining permits for construction and classification of files	768
6.3	Carrying out construction works and installation of energy equipment	5000
7	Testing and Debugging	
7.1	Conducting tests and checking the effectiveness of Power-to-X technology	500
7.2	Integration with Existing Systems	328
7.3	Optimization of system operation taking into account the obtained results	356
7.4	Obtaining the necessary certificates and permits for operation	762
8	Operation and monitoring	
8.1	Starting the Power-to-X system and transitioning to its full operation	630
8.2	Definition of the efficiency and environmental impact monitoring system	806
8.3	Conducting regular maintenance and identifying opportunities for improvement	270

The next step is to draw up a budget plan, which forms the basis of financial planning, determining the purpose and number of allocated resources for specific years (see Table 3.4).

Table 3.4 -Summary of Project Budget

Term of project implementation (T), years=	4			
Additional costs per year, EUR/year	1	2	3	4
	30000	15000	5000	2000
Capital investments (Year 0), EUR	50000			
Standard service life of equipment (Tam), year=	4			
Depreciation of equipment (per year), EUR =	12500,00			

Source: developed by the author

The following is a description of the project budget summary based on the information provided:

This logistics project will be implemented over four years.

Additional operating costs are estimated for each year of the project, starting at 30,000 UAH in Year 1, reducing to 15,000 UAH in Year 2, 5,000 UAH in Year 3, and 2,000 UAH by the final year of the project (Year 4). These represent the ongoing expenses associated with the project, including but not limited to maintenance, utilities, and other operational costs.

Upfront capital investments required for the project amount to 50,000 UAH. These likely cover initial equipment purchases and installations needed at the start of the project. Initial investment made at the beginning of the project (Year 0) for various activities such as equipment purchase, agreements, and other one-time expenses.

The service life of the equipment is estimated to be 4 years, matching the timeframe of the project implementation. With 50,000 UAH in capital investments for equipment and a 4-year service lifetime, the annual depreciation expense for the equipment is calculated to be 12,500 UAH per year (50,000 UAH / 4 years). This reflects the equipment losing value and needing replacement over time.

In summary, the key components shown are the projected multi-year additional costs, the initial capital outlay, the useful life of equipment, and the resulting depreciation amount per year over that lifespan.

Cost schedules constructed based on the budgeted costs for each process and year are presented in Figure 3.4.

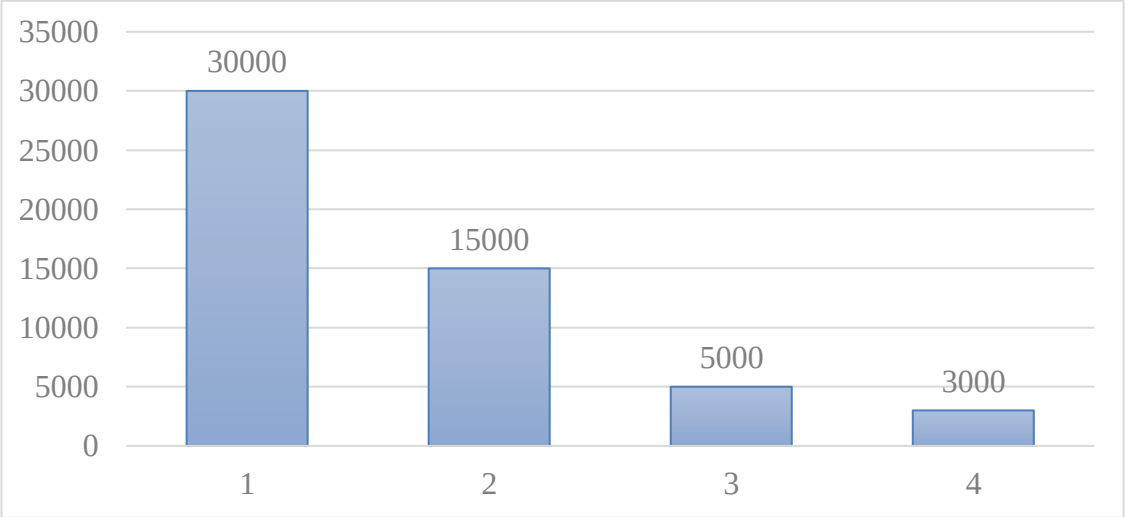


Figure 3.4 - Annual costs during the project implementation period

Source: developed by the author

The logistics project's budget plan serves as a strategic tool, allocating resources and financial needs across tasks for goal attainment. By stressing a fair distribution, it guarantees project success at every level. There are many advantages to integrating green technologies, especially Power-to-X, into DSV's operations. The two main ones are lowering carbon footprint and advancing sustainable development.

Table 3.4 provides an estimate of the logistics project's cost with an emphasis on the use of green technologies. The €530,000 total cost includes several stages, such as planning, risk assessment, financing, documentation, equipment procurement, building, testing, and operation. This thorough budget plan forms the basis of financial planning, guaranteeing the effective use of resources to meet project objectives. In general, it offers information on anticipated expenditures and investments related to the adoption of green technology throughout the multi-year project.

Previously, we provided an estimate and the total cost of the project, which is 530,000 euros. Let's assume that in order to implement this logistics project, the company will do it at the expense of credit funds at a bank rate of 10% per annum or 18% per annum.

Table 3.4 - Financial analysis and project planning

Term of project implementation (T), years=	*4*					
Additional costs per year, UAH/year	1	2	3	4		
	30000	15000	5000	3000		
Capital investments (Year 0), UAH	50000					
Standard service life of equipment (Tam), year=	4					
Depreciation of equipment (per year), UAH =	12500					
Final net fixed assets =	0	1	2	3	4	
	50000	37500	25000	12500	0,00	
Initial net fixed assets =	0	1	2	3	4	5
	0	50000	37500	25000	12500	0,00
6. Total annual revenue for the project =	0	1	2	3	4	
	0	20000	20000	20000	20000	
7. Profit =	0	1	2	3	4	
	0	7500	7500	7500	7500	
9. Cash inflows (current income) =	0	1	2	3	4	
	0	57500	45000	32500	20000	
10. Cash outflows (current costs) =	0	1	2	3	4	
	50000	30000	15000	5000	3000	
Residual (liquidation) value of equipment =	0	1	2	3	4	
	50000	37500	25000	12500	0,00	
Balance of unreturned credit funds (creditor debt) at the end of the 0th year =	50000					
Balance of unreturned credit funds (creditor debt) at the end of a current year =	0	1	2	3	4	
	50000	33500	15845			
Interest for the loan in a current year =	0	1	2	3	4	
	0	3500,00	2345,00	1109,15	0,00	

Source: developed by the author

This table indicates the financial analysis and planning of the project during its four-year implementation period. Key indicators include annual incremental costs, capital investment, equipment life, depreciation, net residual and original asset values, annual income, profit, cash inflows and outflows, residual (liquidation) value of equipment, balance of outstanding loan funds (debt to creditors). of the project is indicated in the zero period. The following costs represent the annual costs of

maintaining and operating the logistics infrastructure. May include depreciation of equipment, repair work and other costs.

Net residual and original asset values show the value of the equipment over its useful life. The annual income is a constant 20,000 UAH; the profit is also constant at the level of 7,500 UAH. Cash inflows include the net income from the project, while cash outlays represent current costs at various stages of the project. The residual (liquidation) value of the equipment decreases in proportion to its service life. The balance of unreturned loan funds (debt to creditors) is determined on the basis of the residual value of the equipment, and also takes into account interest on the loan, which decreases annually.

This financial plan with various parameters provides a complete overview of the financial aspects of the project, helping to carry out strategic planning and effectively manage resources during its implementation.

Based on these data, we will calculate financial indicators to evaluate the efficiency of the logistics project, including net present value (NPV), profitability index (PI), internal rate of return (IRR), and determining the payback period.

The first step is to calculate the net present value (NPV). This indicator shows the amount of money that the investor expects to receive after the investment costs are paid off. All calculations are noted in table 3.5.

Table 3.5 - Net present value (NPV)

Net present value, NPV, UAH =		*0*	*1*	*2*	*3*	*4*
	(r=10%)	*-50000,00*	-25000,00	-206,61	20454,55	32065,77
	(r=20%)	*-50000,00*	-27083,33	-6250,00	9664,35	17862,65

Source: developed by the author

NPV (net present value) equals a positive value at both a 10% discount rate and a 20% discount rate. This indicates that the value of the net profit that the company will receive in the future as a result of the implementation of the logistics project exceeds the cost of the investment for both of the specified discount rates.

This result is very encouraging because a positive NPV indicates that the project generates additional net income. Even with a high discount rate (20%), which reflects a higher risk or possible instability, the project remains financially profitable.

Therefore, the company can consider the implementation of the logistics project as a profitable opportunity that will bring desired profits in the future. A positive NPV is a strong indicator of the financial viability of the project, regardless of the level of the discount rate.

The next step in the calculation is the internal rate of return. They understand the value of the discount factor r, at which the NPV of the project is zero: IRR = r, at which NPV = 0. It shows at what discount rate (bank interest rate) the project moves from the unprofitable zone to the profitable zone. Calculations are listed in Table 3.6.

Table 3.6 - Internal rate of return

r	NPV
10%	32065,77
20%	17862,65
33%	0

Source: developed by the author

The net present value (NPV) assessment table of the project at different discount rates indicates the effectiveness of the project depending on the degree of risk and requirements for return on investment. These values allow you to determine what discount rate will provide a zero NPV and, therefore, determine how sensitive the project is to changes in the discount rate. Additionally, to help with comprehension, let's show this as a graph (Figure 3.5).

At a 10% discount, the NPV is 32,065.77. This indicates that the project has a positive net increase in value at a given level of risk and return on investment requirements. This means that the project will be profitable if the internal rate of return exceeds 10%. In this case, with a given discount rate of 10%, the project is extremely profitable because its IRR exceeds the discount rate.

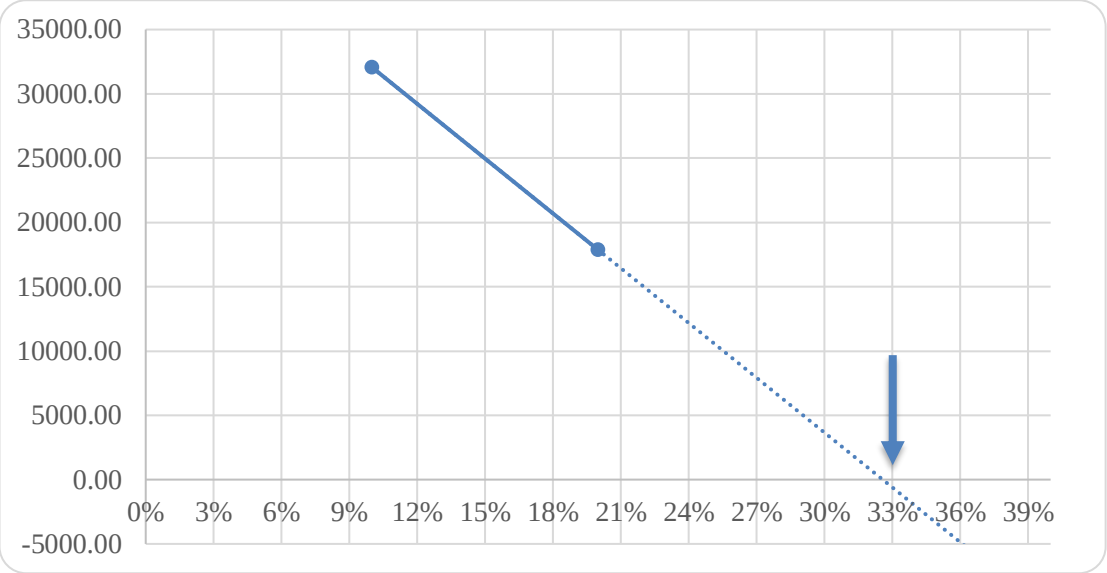


Figure 3.5- Dependence of the net present value on the discount rate

Source: developed by the author

At a 20% discount, the NPV is 17,862.65. Even with a higher level of risk, the project still achieves a positive net increase in value, albeit a smaller one. In this case, with a higher discount rate of 20%, the IRR is still positive, indicating that the project remains profitable. However, its profitability decreases as the relative gap between the IRR and the discount rate narrows.

At a 33% discount, the NPV is zero. This indicates that with a high level of risk, it may be difficult for investors to achieve a positive net present value and the project may become less attractive.

In any case, positive IRR values indicate that the logistics project is financially profitable, but it is important to consider the level of risk and investment sustainability when determining the optimal discount rate for deciding on the implementation of the project. The project is financially profitable at low and moderate levels of risk (discount rates of 10% and 20%), but its effectiveness decreases at high levels of risk (discount rate of 33%). Investors should carefully consider the level of risk and make decisions based on ensuring a sufficient return on investment.

The last step is to determine how long the project will pay off. The payback period is the time required for the amount of investment in the project to be compensated by the revenues from the project. If the discount rate increases, the payback period of the

project increases. This is due to the fact that future cash flows are discounted by a larger amount, which reduces their amount. Let's note this in Figure 3.6 and determine how much this logistics project will pay for itself.

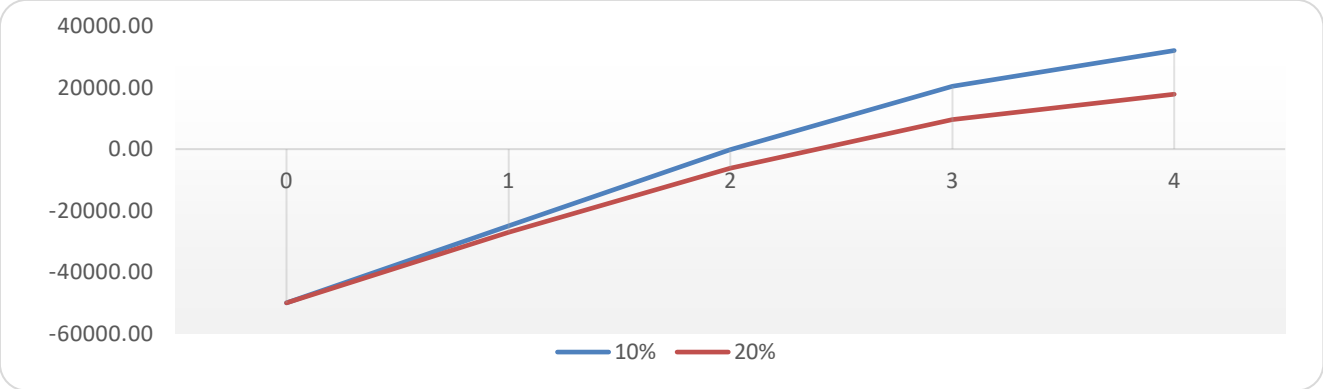


Figure 3.6 - Dependence of the payback period on the discount rate

Source: developed by the author

According to the graph, the project will pay itself off in two years at a 10% discount rate. This indicates that the project's investment will pay for itself in two years at this discount rate. The aforementioned indicator was acquired through the consideration of the discount rate in the computation of net discounted income (NPV) at the 10% threshold. This represents the expense of credit funds, should they be obtained from a bank at the designated rate. The project's payback period will be shorter than two years if the discount rate is less than 10%. This indicates that the project's investment will pay for itself sooner than in two years. It is important to note that the project's payback period of two years signifies that the project's gross profit has turned positive and exceeds its expenses.

3.3 Chapter 3 summary

In the project part of the qualification work, a model of environmentally oriented planning for the logistics business of DSV was developed, which includes an

environmentally friendly design of customer service processes. The model defines the integration of environmentally sustainable solutions at different stages of the logistics chain, from planning to delivery.

To support the proposed model, Power-to-X technology is recommended for implementation, which allows the conversion of excess renewable energy into energy specifically for logistics and transportation purposes. The implementation of this measure will allow DSV to reduce emissions and increase energy efficiency and form a comprehensive approach to the development and integration of environmentally friendly technologies into the company's logistics operations in order to increase efficiency and competitiveness.

To substantiate the feasibility of project implementation, a Gantt chart was developed covering the stages from market research to system commissioning. The total duration of the project is 4 years. In addition, the necessary skills of project team members were identified to ensure the successful completion of tasks at each stage.

The conducted economic assessment of the implementation of the investment project made it possible to determine that the IRR is 33%, and the NPV has a positive value in the range of the discount rate from 10% to 20%, which allows you to adjust the calculations, taking into account changes in the factors of the external and internal environment that affect obtaining the total result

CONCLUSIONS AND RECOMMENDATIONS

The qualification work is devoted to the issues of planning an ecologically oriented process of customer service in the logistics sphere using the example of the DSV company. The conducted research allows us to draw the following conclusions.

The theoretical chapter of the qualification work considers theoretical approaches to the planning of an ecologically oriented process of customer service for a logistics organization.

It has been researched that planning is an integral part of the successful management of any organization, especially in the logistics sector where customer satisfaction and operational efficiency are key factors. However, in today's realities, companies must also consider the impact of their activities on the environment and implement appropriate methods to minimize the negative impact on the environment. Therefore, the process of planning customer service in a logistics company should include an environmental component.

The importance of integrating environmental factors at each stage of planning to ensure the sustainable development of the company is emphasized. The author provides a comprehensive explanation of the cyclical approach to the design of environmentally safe customer service. Such an iterative planning methodology allows a logistics company not only to improve the quality of customer service but also to integrate environmental practices into its operations, which meets the modern requirements of sustainable development and social responsibility of business.

The analysis of the business portfolio of the logistics company DSV carried out in the analytical section of the qualification work, revealed that the company is one of the world's leading freight forwarders. The company`s strategy is keeping supply chains flowing in a world of change, acknowledging their role as part of the global infrastructure enabling world trade. The business model of the company is flexible and asset-light, which helps to keep supply chains flowing efficiently, from shipper to consignee.

Diagnostics of the financial and economic activity of the Ukrainian division of the DSV company based on the analysis of assets, liabilities and capital, as well as indicators of liquidity, financial stability and business activity, showed that the financial condition of the company remains stable in general, which, given the conditions of martial law in Ukraine, is a positive trend.

The analysis showed that DSV is making efforts to reduce the negative impact on the environment. However, at the moment, a completely "green" supply chain has not yet been implemented. The company is moving in this direction gradually, implementing environmental initiatives at various stages of the logistics process. In particular, more ecological modes of transport are used, delivery routes are optimized, and innovative solutions for waste management and resource saving are used.

It can be stated that DSV's activities are aimed at increasing the efficiency and sustainability of supply chains while simultaneously reducing the negative impact on the environment. However, the company has not yet achieved the ideal of absolutely ecological logistics. Full implementation of the green supply chain concept will require significant further investment and innovation.

In the third chapter, the issue of ecologically oriented planning of customer service processes of the logistics company DSV is thoroughly investigated. Based on the analysis, a specialized conceptual model adapted to the specifics of the company's activities was developed.

The proposed model substantiates the integration of environmentally sustainable solutions at all stages of the logistics chain - from initial planning to the final delivery of goods to consumers. Special attention was paid to the implementation of the promising Power-to-X technology, the potential of which was thoroughly investigated. This technology allows you to convert excess renewable energy (for example, from solar or wind power plants) into other types of energy suitable for use in logistics and transportation, such as synthetic fuels, hydrogen, stored thermal energy, etc.

The developed model is substantiated in detail by how the Power-to-X technology can be integrated into various links of the DSV logistics chain - logistics terminals, vehicles, and auxiliary infrastructure. It has been studied that such an implementation

ensures a significant reduction of CO2 emissions and other harmful substances during the entire cycle of customer service - from receiving the order to the final delivery of goods.

In general, the chapter substantiates that the proposed model demonstrates a comprehensive approach to building a highly efficient and at the same time environmentally sustainable logistics system in the DSV company by integrating innovative green energy technologies. This fully corresponds to the current global trends of decarbonization and helps to significantly increase the competitive position of the company in the market of ecologically responsible logistics.

In light of the above, recommendations are offered for improving this process of environmentally-oriented customer service of a logistics company:

1. To find new and better ways to serve customers, it is important to continue to use a circular methodology to create environmentally friendly customer service processes. Throughout the logistics chain, from transportation to warehousing and the last mile of delivery, proactively apply green solutions. In particular, electric and hydrogen vehicles, warehouse automation, the use of drones, blockchain for tracking, etc. are potential technologies that deserve more attention.

2. To create and implement environmentally friendly logistics solutions, it is important to closely cooperate with public organizations, research institutes and state institutions. Support important industry projects with your full support.

3. Stay abreast of market developments, technologies and best practices by regularly reviewing and updating the company's sustainability plan. Make the most of advanced IT and digital solutions to optimize logistics operations, reduce paperwork and introduce contactless interaction with customers. This will reduce the impact on the environment as well as increase efficiency.

4. Maintain adequate investment funds for environmental initiatives by further improving financial and cost management systems.

Adherence to these guidelines will allow logistics organizations to take the lead in green logistics by effectively incorporating environmental considerations into their operations.

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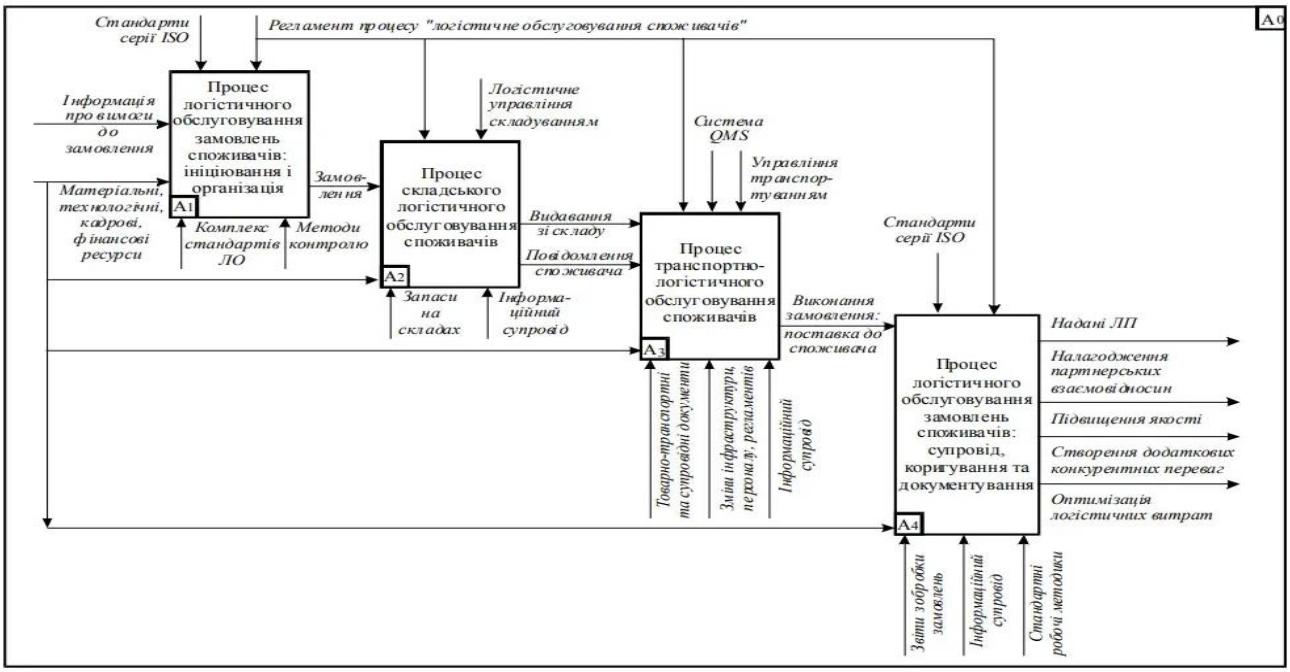
5.

APPENDIX A
General scheme of logistics service process



APPENDIX B
Comparative analysis of financial indicators by business segmentation

	Air & Sea				Road				Solutions				Total			
Segment information - divisions (DKKm)	**2021**	**2022**	**2023**	**Deviation 2021- 2023 %**		**2022**	**2023**	**Deviation 2021- 2023 %**	**2021**	**2022**	**2023**	**Deviation 2021- 2023 %**	**2021**	**2022**	**2023**	**Deviation 2021- 2023 %**
Condensed income statement																
Revenue	130899	172868	92438	-29,38	33007	38746	35509	7,58	17989	23826	22482	24,98	182306	235665	150785	-17,29
Intercompany revenue	1002	1563	534	-46,71	2339	2761	2646	13,13	745	583	658	-11,68				
Divisional revenue	**131901**	**174431**	**92972**	**-29,51**	**35416**	**41507**	**38155**	**7,73**	**18734**	**24409**	**2314**	**-87,65**	**182306**	**235665**	**150785**	**-17,29**
Direct Costs	108132	139807	67002	-38,04	28321	33596	30295	6,97	12081	15091	1363	-88,72	144691	183516	106967	-26,07
Gross Profit	**23769**	**34624**	**25970**	**9,26**	**7095**	**7911**	**786**	**-88,92**	**6653**	**9318**	**951**	**-85,71**	**37615**	**52149**	**43818**	**16,49**
Other External Expenses	3366	4244	3574	6,18	1122	1425	1428	27,27	1338	1759	1782	33,18	4173	5559	4838	15,94
Staff Costs	6598	8471	7877	19,38	3149	3543	3574	13,50	1664	2254	2418	45,31	13025	16315	15983	22,71
Operating Profit Before Depreciation Amortization and Special Ite	**13805**	**21909**	**14519**	**5,17**	**2824**	**2943**	**2858**	**1,20**	**3651**	**5305**	**531**	**-85,46**	**20417**	**30275**	**22997**	**12,64**
Depreciation and Amortization	1037	1251	1156	11,48	967	903	849	-12,20	1876	2604	2955	57,52	4194	5071	5274	25,75
Operating Profit (EBIT) Before Special Items	**12768**	**20658**	**13363**	**4,66**	**1857**	**204**	**2009**	**8,19**	**1775**	**2701**	**2355**	**32,68**	**16223**	**25204**	**17723**	**9,25**
Condensed balance sheet																
Total gross investments	17262	1797	1776	-89,71	1958	501	1057	-46,02	4118	4338	5229	26,98	31202	6801	8537	-72,64
Total assets	96879	93821	80257	-17,16	24135	24437	25702	6,49	26245	30730	29347	11,82	161395	159045	147110	-8,85
Total liabilities	79824	67546	50336	-36,94	18883	19057	17547	-7,08	20310	24658	23357	15,00	87117	87304	78144	-10,30

APPENDIX C
Horizontal Analysis and Vertical Analysis of Assets

BALANCE SHEET, ASSETS	2021	2022	2023	Deviation		Deviation, %		Share in the structure of the balance sheet			Deviation, %	
				2021-2022	*2022-2023*	*2021-2022*	*2022-2023*	*2021*	*2022*	*2023*	*2021-2022*	*2022-2023*
Intangibles assets	76 661	77 674	77 106	1 013	-568	1,32	-0,73	47,50	48,84	52,41	1,34	3,58
Right-of-use assets	13 709	14 694	15 655	985	961	7,19	6,54	8,49	9,24	10,64	0,74	1,40
Property, plant and equipment	6 262	6 284	6 214	22	-70	0,35	-1,11	3,88	3,95	4,22	0,07	0,27
Other receivables	2 395	2 461	2 461	66	0	2,76	0,00	1,48	1,55	1,67	0,06	0,13
Deferred tax assets	3 544	3 494	3 300	-50	-194	-1,41	-5,55	2,20	2,20	2,24	0,00	0,05
Total non-current assets	**102 571**	**104 607**	**104 736**	**2 036**	**129**	**1,98**	**0,12**	**63,55**	**65,77**	**71,20**	**2,22**	**5,42**
								0,00	0,00	0,00	0,00	0,00
Trade receivables	36 369	32 387	22 296	-3 982	-10 091	-10,95	-31,16	22,53	20,36	15,16	-2,17	-5,21
Contract assets	9 797	5 785	4 985	-4 012	-800	-40,95	-13,83	6,07	3,64	3,39	-2,43	-0,25
Inventories	284	1 889	4 314	1 605	2 425	565,14	128,37	0,18	1,19	2,93	1,01	1,74
Other receivables	4 009	4 179	4 283	170	104	4,24	2,49	2,48	2,63	2,91	0,14	0,28
Cash and cash equivalents	8 299	10 160	6 452	1 861	-3 708	22,42	-36,50	5,14	6,39	4,39	1,25	-2,00
Assets held for sale	66	38	44	-28	6	-42,42	15,79	0,04	0,02	0,03	-0,02	0,01
Total current assets	**58 824**	**54 438**	**42 374**	**-4 386**	**-12 064**	**-7,46**	**-22,16**	**36,45**	**34,23**	**28,80**	**-2,22**	**-5,42**
											0,00	0,00
Total assets	**161 395**	**159 045**	**147 110**	**-2 350**	**-11 935**	**-1,46**	**-7,50**	**100,00**	**100,00**	**100,00**	**0,00**	**0,00**

APPENDIX D
Horizontal Analysis and Vertical Analysis of Equity and Liabilities

BALANCE SHEET, EQUITY AND LIABILITES	2021	2022	2023	Deviation		Deviation, %		Share in the structure of the balance sheet			Deviation, %	
				2021-2022	*2022-2023*	*2021-2022*	*2022-2023*	*2021*	*2022*	*2023*	*2021-2022*	*2022-2023*
Share capital	240	219	219	-21	0	-8,75	0,00	0,15	0,14	0,14	-0,01	0,00
Reserves and retained earnings	73 863	71 300	68 484	-2 563	-2 816	-3,47	-3,95	45,77	44,83	43,06	-0,94	-1,77
DSV A/S shareholders' share of equity	**74 103**	**71 519**	**68 703**	**-2 584**	**-2 816**	**-3,49**	**-3,94**	**45,91**	**44,97**	**43,20**	**-0,95**	**-1,77**
Non-controlling interests	175	222	263	47	41	26,86	18,47	0,11	0,14	0,17	0,03	0,03
Total equity	**74 278**	**71 741**	**68 966**	**-2 537**	**-2 775**	**-3,42**	**-3,87**	**46,02**	**45,11**	**43,36**	**-0,92**	**-1,74**
Lease liabilities	11 848	13 190	14 139	1 342	949	11,33	7,19	7,34	8,29	8,89	0,95	0,60
Borrowings	16 993	21 398	20 004	4 405	-1 394	25,92	-6,51	10,53	13,45	12,58	2,93	-0,88
Pensions and similar obligations	908	1 183	1 281	275	98	30,29	8,28	0,56	0,74	0,81	0,18	0,06
Provisions	3 508	4 260	3 772	752	-488	21,44	-11,46	2,17	2,68	2,37	0,50	-0,31
Deferred tax liabilities	447	504	609	57	105	12,75	20,83	0,28	0,32	0,38	0,04	0,07
Total non-current liabilities	**33 704**	**40 535**	**39 805**	**6 831**	**-730**	**20,27**	**-1,80**	**20,88**	**25,49**	**25,03**	**4,60**	**-0,46**
Lease liabilities	3 440	3 577	3 808	137	231	3,98	6,46	2,13	2,25	2,39	0,12	0,15
Borrowings	4 472	814	2 139	-3 658	1 325	-81,80	162,78	2,77	0,51	1,34	-2,26	0,83
Trade payables	17 040	14 992	13 111	-2 048	-1 881	-12,02	-12,55	10,56	9,43	8,24	-1,13	-1,18
Accrued cost of services	13 289	12 085	7 920	-1 204	-4 165	-9,06	-34,46	8,23	7,60	4,98	-0,64	-2,62
Provisions	1 841	2 407	1 967	566	-440	30,74	-18,28	1,14	1,51	1,24	0,37	-0,28
Other payables	10 257	9 640	8 138	-617	-1 502	-6,02	-15,58	6,36	6,06	5,12	-0,29	-0,94
Tax payables	3 074	3 254	1 256	180	-1 998	5,86	-61,40	1,90	2,05	0,79	0,14	-1,26
Total current liabilities	**53 413**	**46 769**	**38 339**	**-6 644**	**-8 430**	**-12,44**	**-18,02**	**33,09**	**29,41**	**24,11**	**-3,69**	**-5,30**
Total liabilities	**87 117**	**87 304**	**78 144**	**187**	**-9 160**	**0,21**	**-10,49**	**53,98**	**54,89**	**49,13**	**0,92**	**-5,76**
Total equity and liabilities	**161 395**	**159 045**	**147 110**	**-2 350**	**-11 935**	**-1,46**	**-7,50**	**100,00**	**100,00**	**92,50**	**0,00**	**-7,50**

APPENDIX E

Hierarchical structure of the work of the project on the implementation of "green" technologies in the activities of the logistics provider [4]

Task code	Task Name	Description
1	***Preparatory stage***	
1	***2***	3
1.1	Determination of strategic goals for the introduction of "green" technologies in logistics activities	This stage involves defining strategic goals for implementing "green" technologies in logistics activities, including reducing the carbon footprint, increasing resource efficiency, environmental improvement, and enhancing competitiveness.
1.2	Market analysis of "green" technologies and Power-to-X	At this stage, an analysis of the market for "green" technologies and Power-to-X is carried out in order to determine the best solutions for the logistics provider.
1.3	Determining the amounts and types of energy that can be converted using Power-to-X	Identify the volumes and types of energy that can be converted using Power-to-X technology, aligning them with the logistics provider's requirements.
1.4	Signing an agreement with Power-to-X technology developers	At this stage, an agreement is signed with the developers of Power-to-X technologies, in order to ensure the implementation of the project.
2	***Risk and security management***	
2.1	Identification of potential risks associated with the implementation of Power-to-X.	Assess potential risks associated with implementing Power-to-X technology.
2.2	Development and implementation of a risk management plan.	Create and execute a comprehensive risk management plan to mitigate identified risks.
3	***Documentation and approval***	
3.1	Development of technical documentation for Power-to-X implementation	Create technical documentation for Power-to-X implementation, encompassing plans, specifications, work schedules, and cost estimates.
3.2	Approval of plans and specifications using "green" technologies	Plans and specifications using "green" technologies are approved by the management of the logistics provider.
3.3	Review and approval of the territory plan for the placement of energy equipment	The plan of the territory for the placement of energy equipment is reviewed and approved by the management of the logistics provider.
4	***Financing and Investments***	
4.1	Development of a financial plan	Develop a comprehensive financial plan detailing the costs and funding required for Power-to-X implementation.
4.2	Financial approval of the project and obtaining the necessary funds for implementation	The Power-to-X implementation project is financially approved by the management of the logistics provider, after which the logistics provider receives the necessary funds for the implementation of the project.

Continuation of appendix E

1	***2***	3
5	***Ordering equipment and materials***	
5.1	Creation of copies of technical plans and specifications	Copies of technical plans and specifications are created for future use.
5.2	Choice of technology and suppliers	Choose appropriate technology and suppliers for Power-to-X equipment procurement.
5.3	Ordering the necessary equipment for energy conversion using Power-to-X technology	The necessary equipment for energy conversion using the Power-to-X technology is being ordered from suppliers.
6	***Construction stage***	
6.1	Development of the work schedule and determination of rates for construction	A work schedule is developed and rates for construction are determined.
6.2	Obtaining permits for construction and classification of files	Building permits are obtained and files are classified.
6.3	Carrying out construction works and installation of energy equipment	Construction works and installation of energy equipment are being carried out.
7	***Testing and Debugging***	
7.1	Conducting tests and checking the effectiveness of Power-to-X technology	Tests are conducted and the effectiveness of Power-to-X technology is verified.
7.2	Integration with Existing Systems	Integrate Power-to-X systems with existing logistics systems.
7.3	Optimization of system operation taking into account the obtained results	The operation of the system is optimized taking into account the obtained results.
7.4	Obtaining the necessary certificates and permits for operation	Acquire necessary certificates and operational permits for the system's functionality.
8	***Operation and monitoring***	
8.1	Starting the Power-to-X system and transitioning to its full operation	At this stage, the Power-to-X system starts up and goes into full operation.
8.2	Definition of the efficiency and environmental impact monitoring system	A system for monitoring the efficiency and environmental impact of the Power-to-X system is being implemented.
8.3	Conducting regular maintenance and identifying opportunities for improvement	Regular maintenance of the Power-to-X system is carried out and opportunities for its improvement are identified.

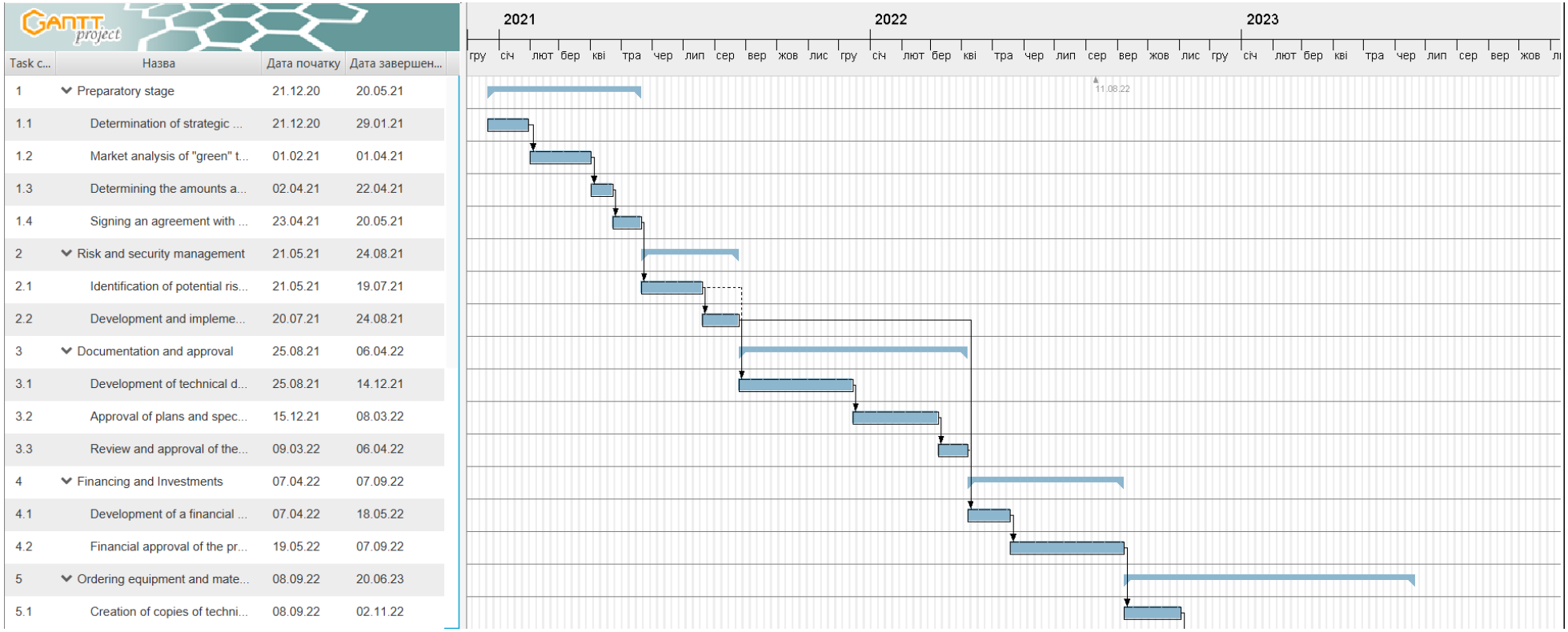
APPENDIX F
Interrelationships between works during project implementation and its parameters

Task code	Task Name	Employees and their number				Duration, days	Predecessor	
1	*2*	3	4	5	6	7	8	9
1	***Preparatory stage***							
1.1	Determination of strategic goals for the introduction of "green" technologies in logistics activities	General director	1			30		
1.2	Market analysis of "green" technologies and Power-to-X	General director	1	Analyst	1	44	1.1	
1.3	Determining the amounts and types of energy that can be converted using Power-to-X	Executive Director	1	Technical director	1	15	1.2	
1.4	Signing an agreement with Power-to-X technology developers	Executive Director	1	General director	1	20	1.3	
2	***Risk and security management***							
2.1	Identification of potential risks associated with the implementation of Power-to-X.	Risk manager	1			42	1.4	
2.2	Development and implementation of a risk management plan.	Risk manager	1			26	2.1	
3	***Documentation and approval***							
3.1	Development of technical documentation for Power-to-X implementation	Technical director	1			80	2.3	2.2
3.2	Approval of plans and specifications using "green" technologies	General director	1	Technical director	1	60	3.1	
3.3	Review and approval of the territory plan for the placement of energy equipment	Executive Director	1			21	3.2	
4	***Financing and Investments***					0		
4.1	Development of a financial plan	Financial Director	1	Manager	1	30	3.3	2.2
4.2	Financial approval of the project and obtaining the necessary funds for implementation	Financial Director	1	General director	1	80	4.2	
5	***Ordering equipment and materials***							
5.1	Creation of copies of technical plans and specifications	Technical director	1			40	4.3	
5.2	Choice of technology and suppliers	Technical director	1	Manager	1	58	5.1	

Continuation of appendix F

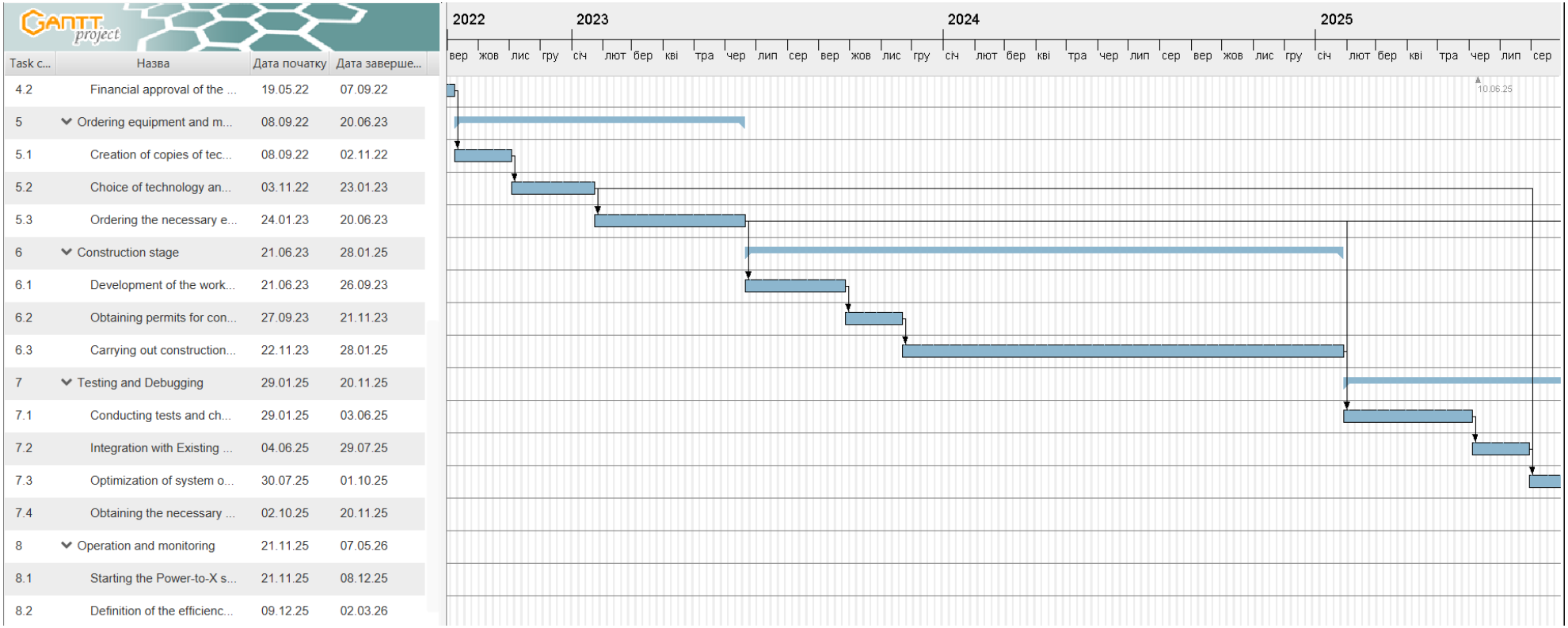
1	*2*	3	4	5	6	7	8	9
5.3	Ordering the necessary equipment for energy conversion using Power-to-X technology	Technical director	1	Manager	1	106	5.2	
6	***Construction stage***							
6.1	Development of the work schedule and determination of rates for construction	Technical director	1	Manager	2	70	5.4	
6.2	Obtaining permits for construction and classification of files	Technical director	1	Manager	2	40	6.1	
6.3	Carrying out construction works and installation of energy equipment	Technical director	1	Manager	2	310	6.2	
7	***Testing and Debugging***							
7.1	Conducting tests and checking the effectiveness of Power-to-X technology	Technical director	1	Manager	2	90	6.3	5.4
7.2	Integration with Existing Systems	Technical director	1	Manager	2	40	5.2	7.1
7.3	Optimization of system operation taking into account the obtained results	Technical director	1	Manager	2	46	5.3	7.2
7.4	Obtaining the necessary certificates and permits for operation	Executive Director	1			36	5.4	7.3
8	***Operation and monitoring***							
8.1	Starting the Power-to-X system and transitioning to its full operation	Technical director	1	Manager	1	12	8.2	
8.2	Definition of the efficiency and environmental impact monitoring system	Technical director	1	Manager	1	60	9.1	
8.3	Conducting regular maintenance and identifying opportunities for improvement	Technical director	1	Manager	1	48	9.2	

APPENDIX J
Figure F.1 - Gantt chart



Task c...	Назва	Дата початку	Дата завершен...
1	Preparatory stage	21.12.20	20.05.21
1.1	Determination of strategic ...	21.12.20	29.01.21
1.2	Market analysis of "green" t...	01.02.21	01.04.21
1.3	Determining the amounts a...	02.04.21	22.04.21
1.4	Signing an agreement with ...	23.04.21	20.05.21
2	Risk and security management	21.05.21	24.08.21
2.1	Identification of potential ris...	21.05.21	19.07.21
2.2	Development and impleme...	20.07.21	24.08.21
3	Documentation and approval	25.08.21	06.04.22
3.1	Development of technical d...	25.08.21	14.12.21
3.2	Approval of plans and spec...	15.12.21	08.03.22
3.3	Review and approval of the...	09.03.22	06.04.22
4	Financing and Investments	07.04.22	07.09.22
4.1	Development of a financial ...	07.04.22	18.05.22
4.2	Financial approval of the pr...	19.05.22	07.09.22
5	Ordering equipment and mate...	08.09.22	20.06.23
5.1	Creation of copies of techni...	08.09.22	02.11.22

Figure F.2 - Gantt chart



Task c...	Назва	Дата початку	Дата заверше...
4.2	Financial approval of the ...	19.05.22	07.09.22
5	Ordering equipment and m...	08.09.22	20.06.23
5.1	Creation of copies of tec...	08.09.22	02.11.22
5.2	Choice of technology an...	03.11.22	23.01.23
5.3	Ordering the necessary e...	24.01.23	20.06.23
6	Construction stage	21.06.23	28.01.25
6.1	Development of the work...	21.06.23	26.09.23
6.2	Obtaining permits for con...	27.09.23	21.11.23
6.3	Carrying out construction...	22.11.23	28.01.25
7	Testing and Debugging	29.01.25	20.11.25
7.1	Conducting tests and ch...	29.01.25	03.06.25
7.2	Integration with Existing ...	04.06.25	29.07.25
7.3	Optimization of system o...	30.07.25	01.10.25
7.4	Obtaining the necessary ...	02.10.25	20.11.25
8	Operation and monitoring	21.11.25	07.05.26
8.1	Starting the Power-to-X s...	21.11.25	08.12.25
8.2	Definition of the efficienc...	09.12.25	02.03.26

Figure F.3 - Gantt chart