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THE ROLE OF SUSTAINABLE FINANCE IN THE CONTEXT OF THE EUROPEAN GREEN COURSE

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ABSTRACT. The European Green Deal can be seen as a societal step towards a holistic, all-encompassing approach to climate and environmental challenges. It attempts to integrate environmental policy by bringing together and improving several existing policies, initiatives and funding programs that address sustainability and climate change. This article analyzes the goals and objectives of the European Green Deal, as well as strategies for their implementation. The article establishes that the European Green Course is a long-term process that aims to build a better future for society and its main goal is the creation of a sustainable society. This goal can only be achieved with a holistic, all-encompassing approach. The article also presents a theoretical conceptualization of sustainable finance and establishes that the appropriate distribution of investments and finances can lead to a successful and even transition of society towards sustainability and environmental improvement. Properly used, sustainable finance reduces the risk of societal negativity, which can be caused by the unavoidably high costs. In addition, systematic increases in funding are expected to result in a stable transition of society to sustainability. Although the correlation analysis does not show a direct relationship between sustainable finance for environmental protection and the implementation of the European Green Deal objectives, the research results indicate a strong correlation between the European Green Deal objectives and the allocation of sustainable finance to research and development and renewable energy resource usage. These differing conclusions can be explained by the fact that the allocation of sustainable finance to environmental protection is a much broader area than the other two variables analyzed separately. In addition, 27 EU countries have been ranked according to the effectiveness of their implementation of EGD directives and economic transition to pro-ecological technologies as of 2021. The positions of Lithuania, Latvia, and Estonia have been determined and examined in detail.

JEL Classification: J10, I25 ***Keywords***: sustainable development; sustainable finance, the Green Deal; European Green Course, TOPSIS method

Introduction

The ever-growing population, increasing consumption, and rapid depletion of the Earth's resources in pursuit of satisfying consumer needs have created negative environmental consequences, which are now preventing the achievement of sustainability. Thus, in order to increase sustainability, we must fundamentally change our social and economic behavior as humanity, change governance structures and norms, and ensure the stability of essential resources (Chkhan, 2021; Bhattarai et al., 2023). Systematic and timely international cooperation is needed to eliminate obstacles slowing down the implementation of sustainable development ideas (Dat & Hung, 2023; Otavova et al., 2023). There is also a need for concrete action plans that help to create and maintain sustainability taking into account possible negative developments in the future. This is the principle behind the Paris Agreement on climate change, which was adopted in 2015. This agreement was supplemented by the 17 Sustainable Development Goals (SDG), which were approved by the UN in 2015 (Zetzche, Anker-Sorensen, 2022).

On December 11, 2019, another significant stride toward environmental preservation and sustainability was made when Ursula von der Leyen, the President of the EU Commission, unveiled the European Green Deal. Its primary objective is to position Europe as the world's inaugural climate-neutral continent by 2050. The Green Deal represents a fresh growth strategy designed to foster sustainability across the EU's economy, industry, and transportation sectors (Long and Blok, 2021). This ambitious European climate initiative endeavors to transform a political pledge into a binding legal obligation for all EU member states.

However, the implementation of the European Green Deal principles requires the use of unprecedented methods of obtaining financial resources which would enable the achievement of both national and international sustainability development goals (Fetting, 2020). This means that the private sector must also be involved in the implementation of sustainability goals in order to fill possible funding gaps that the public sector alone cannot cover. In such conditions, the financial sector plays an important role in raising and distributing the necessary capital for sustainable financing. However, an efficient and stable financial sector requires an appropriate management policy and regulatory framework (Ozili, 2021).

The Green Deal represents a societal shift toward a comprehensive, inclusive approach to tackling climate and environmental issues. Through the European Green Deal, efforts are made to consolidate environmental policies by enhancing various existing policies, initiatives, and funding programs (Štreimikienė et al., 2022; Olzhebayeva et al., 2023). This integrated approach aims to address sustainability and climate change challenges effectively.

It should be noted that the European Green Course is a relatively new term in the scientific literature. Accordingly, all scientific studies are new and relevant for today. In one such study, Knez, Štrbac and Podbregar (2022) chose climate change as their focus in the countries of the Western Balkans and aimed to assess whether the risk of climate change is observed in these countries, how the relevant institutions react to it, what sustainability strategies are applied in these areas, and how they help to implement the objectives of the European Green Deal. Rosamond and Dupont (2021) analyzed the readiness of the Council of Europe to implement the goals of the Green Deal. Their work investigated the preparedness of institutions from a managerial point of view. Meanwhile, Schoenefeld (2021) chose the other side of the European green course – monitoring and accurate evaluation of implementation. In

his work, he sought to find out how the achievement of the Green Course goals would be evaluated, thus he sought to identify guidelines that would help to understand whether the European Green Course had already been fully implemented and what measures needed to be taken to achieve it. Therefore, the analysis of scientific sources suggests that the researchers mainly focused on the implementation policy of the Green Course in their work when analyzing the European Green Deal.

Analyzing the level of research on sustainable finance, it has also been noticed that more active examination of this area has been observed in recent years, when there is more and more talk about the European Green Course. However, it should be mentioned that the direct impact of sustainable finance on the greenback is not yet so widely analyzed. In their work, Long and Blok (2021) selected financing challenges related to the implementation of the green course. Meanwhile, Ozili (2021) in his work focused more on how to make sustainable finance even more sustainable when the goals of the green course are implemented. Chkhan (2021) also analyzed sustainable finance from another angle. In his work, he sought to reveal how the green economy (also known as the European Green Deal) can help to absorb sustainable finance, which is necessary to achieve the goals of the Green Deal. Sustainable finance, its implementation and role in environmental protection have been extensively analyzed by researchers such as Agarbiceanu and Paun (2021), Ziolo, Bak and Cheba (2021), Muhamad, Kusairi, and Zamri, (2021), Zetzche, Anker-Sorensen (2022), Ziolo (2021), Streimikiene, Mikalauskiene, and Burbaite, (2023) and others.

From the analysis of scientific sources and the level of investigation of the problem, it can be seen that both environmental protection and the European green course and sustainable finance have been talked about for some time and there are quite a few studies conducted. However, it is noticeable that the link between sustainable finance and the green rate is still little analyzed. Since the green rate, as a term and strategy itself, only appeared at the end of 2019, it is natural that we still have little data on the benefits and role of sustainable finance in the context of the European green rate.

The article analyzes how sustainable finance can influence the implementation of the goals of the European Green Deal. The literature review presented in the article examines the topic and presents the theoretical concept of sustainable finance, taking into account areas of activity and potential impacts of sustainable finance.

The structure of the article is as follows: review of scientific literature, theoretical conceptualization of sustainable finance, identifying the biggest threats to the global economy that can determine the successful or unsuccessful implementation of the European Green Course and the use of sustainable finance. The article presents the research methodology and research results and discussion with conclusions and suggestions.

1. Literature review

Several years after the European Green Deal (EGD) presented by the European Commission, the need to take action to reduce the climate crisis has not diminished. Although from 2020 March news was dominated by the ongoing Covid-19 pandemic, yet 2020 is considered one of the hottest years on record in terms of temperature. Also to date, it has been noted that the global economic slowdown has contributed to a record 7% reduction in carbon dioxide emissions, however this is only temporary, as air pollution may start to rapidly increase again once the economy recovers (UNIDO Brussels Focus, 2020). For this reason, a strategy for long-term changes in the economic system is needed.

The EGD is the latest and most advanced initiative of the current European Commission (hereinafter the Commission), which was presented by the President of the Commission, Ursula

von der Leyen, in 2019 December 11. This strategy consists of several different initiatives, strategies and legislation, which together aim to enable a just, sustainable and inclusive transformation of Europe's society and economy.

The EGD can also be considered the latest growth strategy of the European Union (EU), which "aims to transform the EU into a fair and prosperous society with a competitive economy" (European Commission, 2022). It is also an essential part of the EU's plan to reduce climate change, which aims to achieve the 2030 sustainable development goals. One of the goals of EGD is to reduce the negative impact of people on the environment, to involve citizens in the creation of public welfare and to create an EGD management policy based on the principle of justice.

The European Commission introduced the Green Deal to both EU institutions and the public on December 11, 2019. In January 2020, following a parliamentary discussion, the European Parliament endorsed the EGD. However, it emphasized that further efforts are necessary within this strategy to ensure a fair and systematic transition that safeguards socially vulnerable groups in society (Schoenmaker, 2017; Chkhan, 2021). The European Parliament also called for higher intermediate targets, most related to reducing carbon emissions. For this reason, the main objectives of the ECHR are considered to be:

- the net amount of greenhouse gases until 2050 is equal to zero;
- decoupling economic growth from resource use;
- no people and no places are left behind.

However, the EGD is not considered a law that EU member states must follow, as it includes a common policy strategy, ambitions and goals across policy sectors (G20 Sustainable Finance Roadmap, 2021). For this reason, in order to implement it, existing regulations and standards will be reviewed over the next few years and accordingly new laws will be adopted and new directives will be created with the overall goal of implementing the EGD objectives (UNIDO Brussels Focus, 2020).

Analyzing EGD implementation strategies, it was observed that this includes not only technical issues, such as the search and use of investments, but is also closely related to the formation of public attitudes, when efforts are made to maintain public support and interest in this project.

A just transition mechanism is seen as a key factor in building broad public support, especially among citizens who will be adversely affected by the transition period. The Commission recognizes that during a just transition it is important to create an implementation mechanism that not only helps to achieve the goals of EGD, but is also functional According to Grabbe and Lehne (2019), society may be even more divided if this transition is not focused on social, protection of the most vulnerable persons (Dyllick and Muff, 2016). Despite the needs in poorer regions, populism may be on the rise, which in turn may fuel the public perception that the costs of transformation are not evenly distributed, and that the greatest financial burden is being shifted to those who are already socially vulnerable. On the other hand, emphasizing equity and using the transition period to reduce inequality can promote cohesion between citizens of rich and financially poor countries and regions. In order to maintain public support, the Commission must ensure that the interests of different groups are taken into account in democratic ways (Global Alliance for Banking on Values, 2015).

EGD is essentially a growth strategy that aims to promote the green transformation of society (Shevchenko et al., 2021). The Communication describes the EGD as an opportunity to set Europe on a path of sustainable and inclusive growth. The promise of economic growth has taken on new meaning in light of the recent economic downturn due to efforts to contain the spread of COVID-19. Currently, GDP in Europe is the lowest since 2008 global financial crisis (Agarbiceanu and Paun, 2021). Measures such as government subsidies for short-term work

programs may have contributed to the relatively low unemployment rate compared to 2019. However, in response to this GDP decline, a major program stimulus was promised at both national and EU level through the Next Generation EU Program (Alexander & Fisher, 2018).

2. Theoretical conceptualization of sustainable finance

Sustainable finance encompasses the integration of environmental, social, and governance (ESG) factors into investment processes within the financial sector (Pauliukevičienė & Stankevičienė, 2021; Boros et al., 2023; Sang, 2024; Dewi et al., 2024). This integration facilitates long-term investments in sustainable economic activities and projects. Environmental considerations may involve addressing climate change through mitigation and adaptation measures, conserving biodiversity, preventing pollution, and promoting a circular economy. Social aspects primarily focus on addressing social inequality, fostering social inclusion, managing labor relations, investing in human capital, and supporting communities. Additionally, governance aspects of both public and private institutions, including governance structures, employee relations, and executive compensation, are crucial for ensuring that social and environmental considerations are incorporated into sustainable decision-making (Cochu et al., 2016).

In the context of EU policy, sustainable finance is understood as a form of financing that supports economic growth, reduces environmental pollution and ensures fair social and economic management aspects (Rosamond, and Dupont, 2021). Sustainable finance extends to ensuring transparency regarding the risks linked to ESG factors that could detrimentally affect the financial system (Abbas & Hassouni, 2024; Bilan et al., 2023; Makarenko et al., 2022; Loan et al., 2024; Rieznyk et al., 2023; Serpeninova et al., 2024). It involves mitigating these risks through effective financial management (Belas & Rahman, 2023) and corporate governance (Khan et al., 2023). Sustainable finance is pivotal in advancing policy goals outlined in the EGD and fulfilling the EU's global obligations concerning climate change mitigation and sustainability (Verheyden, Eccles, & Feiner, 2016). Presently, sustainable finance also contributes to channeling investments towards fostering a sustainable economy and facilitating recovery from the adverse effects of the COVID-19 pandemic.

Meanwhile, the EU supports the transition to the adoption of low-carbon technologies, a more efficient use of land resources and a sustainable economy, and actively participates in the development of a financial system supporting sustainable growth in Europe (Agarbiceanu, and Paun, 2021). For this reason, in 2015 important international agreements were concluded, the year of which was the adoption of the UN agenda, which aims to achieve the goals of sustainable development by 2030, and additionally the adoption of the Paris Agreement on climate change (G20 Sustainable Finance Study Group, 2018).

In 2020 September 17 The Commission presented the 2030 climate goals plan, which sets the goal until 2030. to reduce the amount of exhaust gases by 55 percent. In order to achieve these climate and energy goals, the EU needs to invest around EUR 350 billion annually between 2021 and 2030. EUR more than in the previous decade (European Commission, 2022). Although the EU intends to help attract the necessary investments to the European Fund for Strategic Investments, the scale of the investment problem exceeds the capacity of the public sector alone. For this reason, the financial sector plays a very important role in achieving these goals and in the proper distribution of finances. To date, its main goals for the sustainable finance sector are (Long, & Blok, 2021):

- reorient investments to more sustainable technologies and companies;
- to sustainably finance economic growth in the long term;
- contribute to the development of a low-carbon, climate-resilient and circular economy.

It can be argued that sustainable finance encompasses environmental, social and governance aspects which in turn work as a whole towards creating a more sustainable society. By attracting and reorienting existing and new investments and allocating them in the right direction, in this case for the implementation of EGD goals, sustainable finance helps to properly allocate funds taking into account sustainability criteria.

Sustainable finance is related to the integration of sustainable solutions into financial processes, financial market policy and the activities of institutions related to it, which help to create strong, sustainable and inclusive growth of society. The current international debate on sustainability is focused on the environment, especially aspects related to climate change (Fetting, 2020). Indeed, the concept of sustainable finance encompasses a broader scope, incorporating not only green finance but also social and governance dimensions. While green finance specifically focuses on environmentally sustainable initiatives, sustainable finance extends beyond this, integrating considerations of social impact and governance practices into financial decision-making processes. Thus, sustainable finance represents a holistic approach that addresses environmental, social, and governance concerns within the financial sector.

Today, there is still no well-defined term to define the aspects related to environmental protection, social welfare and governance (Chkhan, 2021). For this reason, some scholars present their suggestions on what aspects should be included in the environmental, social and governance aspects of sustainable finance (Figure 1).

Figure 1. Areas of activity and potential impacts of sustainable finance
Source: created by the authors, according to Chkhan, 2021; European Commission, 2022

As can be seen, the financial sector can offer many different investment avenues and societal benefits. However, the extent of integrated ESG aspects varies. Certain institutions can provide minimal solutions towards sustainability through legal projects that should guide the financial sector (Dyllick and Muff, 2016). Such legal projects may include aspects of money laundering, financial terrorism and social exclusion. Despite the great desire of investors to contribute to the creation of sustainability and the pursuit of small financial benefits, the integration of ESG in society is at an initial stage. It should be noted that depending on the goal, ESG processes can be used as a means of reducing risk or creating value (KPMG International entities, 2022).

Scientific sources distinguish three most important and interrelated perspectives that determine the success and importance of sustainable finance development: sustainability, potential risks and efficiency. Analyzing sustainable finance from a sustainability perspective, this type of finance is related to the need to finance sustainable social and economic solutions (Task Force on Climate-related Financial Disclosures, 2017). In order to fill the financing gap in the field of sustainability, it is necessary to use, as yet unprecedented, investment methods. The financial sector plays an extremely important role in this regard, as it allows the mobilization of available financial resources, thus allocating the available financial assets to sustainable projects. It is noticeable that more and more property owners, investment managers and banks themselves are considering this business development option, thus being able to match their available investments with sustainable financing strategies (Fetting, 2020).

With the proper distribution of capital flows, sustainable finance is a necessary condition in order to implement the set development goals of the ESG and the guidelines of the Paris Agreement (European Commission, 2022). However, it is necessary to note that public resources alone are not capable of filling financial gaps. In order to implement sustainability ideas and help society grow in this area, it is important to use private investments as well.

From a risk perspective, sustainable finance focuses on financial risk. Such risks are usually related to the economic results in any part of the economic entity's chain, including investments and debtors' repayment possibilities. The financial sector is obliged to properly identify, assess and be able to manage risks related to sustainability, especially taking into account negative environmental and climate changes (Kaunas Chamber of Commerce, Industry and Crafts, 2021). The risk of pandemics, such as the 2020 The outbreak of COVID-19 is also included in this concept. It should be noted that the World Economic Forum held in 2020 noted and listed the biggest threats to the global economy in its report. They presented the following threats in their report:

- Physical threats – damage to property, land, infrastructure that may occur due to extreme weather conditions, resulting in increased deaths and human migration;
- Transition threat – the risk of rising economic costs and regulatory adjustments during the transition to a more sustainable economy;
- Reputational threat – in order to achieve sustainability goals, most institutions would have to disclose more internal information to a large part of the public, and this idea is not acceptable to everyone;
- Loyalty threat - in the implementation of sustainability goals, there may be those who want to bypass this system and continue to carry out illegal activities, increasing the damage to the environment. Although such offenses are punished accordingly, cases of corruption may still occur (Ozili, 2021).

In recent years, the EU has worked a lot on the sustainable finance system, which in turn would help support the flow of private finance into sustainable economic activity and make

it possible by 2050. transition to a carbon neutral economy. Back in 2018, the EU started to create the essential foundations for sustainable finance.

Analyzing the reasons why Europe needs sustainable finance, several reasons can be distinguished. Although society has made great progress, the economy and society itself are constantly improving and developing further. At the same time, there are more and more environmental threats. For this reason, adverse climate change has influenced the emergence of the EGD program. Also, increased global cooperation in the field of sustainable financing has changed the approach to building a sustainable society (United Nations, 2015). The financial sector, in turn, plays an important role in helping society move towards a more sustainable lifestyle. It can be said that today society is paying a lot of attention not only to the implementation of EGD goals, but also to comprehensive, sustainable recovery from the COVID-19 pandemic (European Commission, 2022).

To date, the EU has identified four main strategies for sustainable finance, thanks to which it is possible to achieve the goals set by the EGD. The first strategy involves the transition of the real economy to sustainable financing (Zetzsche, and Anker-Sorensen, 2022). This strategy provides tools and management guidelines for economic entities, enabling them to finance their transition plans to achieve environmental improvement goals. Sustainable finance can help at this stage:

- support for the financing of certain farm activities, contributing to the reduction of greenhouse gas emissions. Consider the possibilities of extending the EU taxonomy, with efforts recognized for the transition;
- include additional sustainable activities in the EU taxonomy;
- expand sustainable finance standards that drive the transition to sustainable finance.

The second sustainable finance strategy is related to inclusion in the sustainable finance system. This strategy provides opportunities for both individuals and legal entities to have greater access to sustainable finance. Following this sustainable finance strategy is possible:

- provide access to small and medium-sized investors to take advantage of sustainable financing opportunities;
- find out how to use digital technologies for sustainable financing;
- provide greater protection against climate and environmental risks;
- prepare a social taxonomy report.

The third strategy for sustainable finance includes improving the financial sector and deposit resilience for sustainability, a dual materiality perspective. This strategy sets out how the financial sector can contribute to achieving the objectives of the greenback while becoming more resistant to greenwashing. This strategy is considered one of the most important financing strategies (Fetting, 2020). The implementation of this strategy for sustainable finance can be achieved:

- development of financial responsibility standards that adequately reflect sustainability risks and promote natural capital accounting;
- ensure that ESG risk is systematically recorded according to credit ratings and their perspectives;
- integrate sustainability risks in banking systems into risk management and limit risks in the insurance system;
- monitor and timely eliminate possible systemic risks arising from sustainability challenges, with the aim of maintaining long-term financial stability and limiting systemic risks;
- improve science-based targeting and disclosure and monitoring of financial sector liabilities;

- clarify investors' responsibilities and supervision rules, which would reflect the financial sector's contribution to the implementation of the green rate goals;
- improve accessibility, integrity and transparency in ESG market research. Assess supervisory mandates to address greenwashing issues;
- create a reliable monitoring system to measure the progress of the EU financial system;
- improve the cooperation of the institutions, monitoring the compatibility of the EU financial system with the EGD objectives.

A final strategy for sustainable finance involves promoting global ambitions. A fundamental principle of this strategy is to promote international cooperation for sustainable financing. The implementation of this strategy could promote ambitious international cooperation in various forums, thus setting high-level ambitions towards sustainable financing, its development and standards (Kalnbalkite, Pubule, & Blumberga, 2022). It could also be proposed to expand funding internationally, raising new issues and strengthening threat management. Ultimately, this strategy would support low- and middle-income countries in transition. In this way, special tools would be used to help increase opportunities in finding sustainable finance.

3. Research methodology

The Baltic states were chosen for the study: Estonia, Latvia, Lithuania. These states were chosen because of their similarity in political and economic opportunities. The World Bank classifies all three Baltic countries as countries that have a strong economy and maintain a high social development index. The countries' governments cooperate at the intergovernmental and parliamentary level. They also often cooperate in the fields of foreign and security policy, defense, energy and transport. The study assessed both the EGD goals and sustainable finance investments achieved by each country, as well as a comparison with common European indicators in the context of EGD.

EGD was presented to the public at the end of 2019. There was a lot of talk then about the threats and importance of climate change and the need to take decisive action to reduce the negative impact on the environment as soon as possible. And although European member states unanimously agreed on more funding for environmental protection, a few months later the global COVID-19 pandemic was declared. This pandemic caused not only stagnation in economic growth, but also revealed that everything is closely related: the lack of sustainable development affects the general deterioration of the environment, which in turn causes the threat of new pandemics, when national borders are closed, the economy slows down, and jobs are lost. This connection is also visible in the analyzed statistics. The analyzed data shows the slow implementation of EGD goals and the lack of some statistical data. It should be noted that part of the analyzed indicators in the Baltic countries are presented until 2020, while the European general indicators are presented in the Eurostat database until today.

In order to achieve the objectives of the research, the research part is divided into two parts. The first part analyzes the statistical data that are related to the investment of sustainable finance in:

- environmental protection, both in relation to the public and private sectors;
- scientific research and experimental development to achieve sustainability goals;
- promoting the use of renewable energy;
- Baltic states' separation between GDP, the use of natural resources and CO_2 emissions.

The second part of the study determines the relationship between the obtained statistical data between sustainable finance and the achieved EGD goals. The analyses relied on the TOPSIS method (Technique for Order Preference by Similarity to Ideal Solution) (Hwang and

Yoon, 1981), which implemented the classical Euclidean Distance Measure (EDM). The method assumes known input diagnostic variable matrix $X_{ij}, i = 1, \dots, m; j = 1, \dots, n$, where n – the number of diagnostic variables characterising the investigated objects, m – number of ranked (ordered) objects (EU countries) and a set weight vector for the diagnostic variables $w_j \in (0, n); \sum_{j=1}^{n} w_j = n$. Our calculations applied identical weights to each diagnostic variable $w_j = 1$.

The algorithm used in the ranking of EU Member States (in particular analysed Baltic countries) according to the role of sustainable financing in achieving EGD goals takes the following steps:

1. It is expected that all diagnostic variables X_j will be treated as stimulants or destimulants. Features characterised as nominants will be converted to corresponding stimulant values using the following transformation:

$$X_{ij} = \frac{min\{nom_j; X_{ij}^N\}}{max\{nom_j; X_{ij}^N\}}, \quad (1)$$

where: X_{ij}^N – value of the j-th nominant observed for the j-th object, nom_j – nominal value of the j-th variable.

2. A normalised data matrix is created by means of the unitarization procedure according to the formula:

$$Z_{ij} = \frac{X_{ij} - \overline{X_j}}{R_j}, \quad (2)$$

where: $\overline{X_j}$ – is a mean value of the j-th primary variable, and $R_j = \max_i\{X_{ij}\} - \min_i\{X_{ij}\}$ – is the range of the j-th variable.

3. Coordinates for pattern vector a^+ (ideal solution) for optimum values of diagnostic variables and anti-pattern vector a^- (anti-ideal solution) for the worst values of diagnostic variables are determined according to the formulas:

$$a^+ = (a_1^+, a_2^+, \dots, a_n^+) := \left\{\left(\max_{i=1,\dots,m} Z_{ij} | j \in J_S\right), \left(\min_{i=1,\dots,m} Z_{ij} | j \in J_D\right)\right\}, \quad (3)$$

$$a^- = (a_1^-, a_2^-, \dots, a_n^-) := \left\{\left(\min_{i=1,\dots,m} Z_{ij} | j \in J_S\right), \left(\max_{i=1,\dots,m} Z_{ij} | j \in J_D\right)\right\}, \quad (4)$$

where: J_S – set of stimulants, while J_D – set of destimulants.

4. Calculation of distance and the i-th object from pattern EDM_i^+ and anti-pattern EDM_i^-. The calculations used the EDM (Euclidean Distance Measure):

$$EDM_i^+ = \sqrt{\sum_{j=1}^{n}\left(a_j^+ - Z_{ij}\right)^2}, \quad (5)$$

$$EDM_i^- = \sqrt{\sum_{j=1}^{n}\left(a_j^- - Z_{ij}\right)^2} \quad (6)$$

5. An aggregate measure (ranking index) corresponding to the degree of similarity of the investigated objects to the ideal solution is determined using the formula:

$$TOPSIS\ (EDM) R_i = \frac{EDM_i^-}{EDM_i^- + EDM_i^+}, \quad (7)$$

for i=1,…,m; where: $0 \leq R_i \leq 1$.

6. The objects are placed in a decreasing order depending on the value of measure R_i and a final ranking is generated for the objects (European Union countries). The greater the values of the calculated synthetic index for the country, the higher the country's position in the ranking.

4. Research results and discussion

During the research, it was chosen to assess how much each analyzed state allocated sustainable finance to environmental protection, both after assessing the entire country's economy and after dividing it according to private and public sector investments. The collected data is expressed as a percentage of the country's GDP.

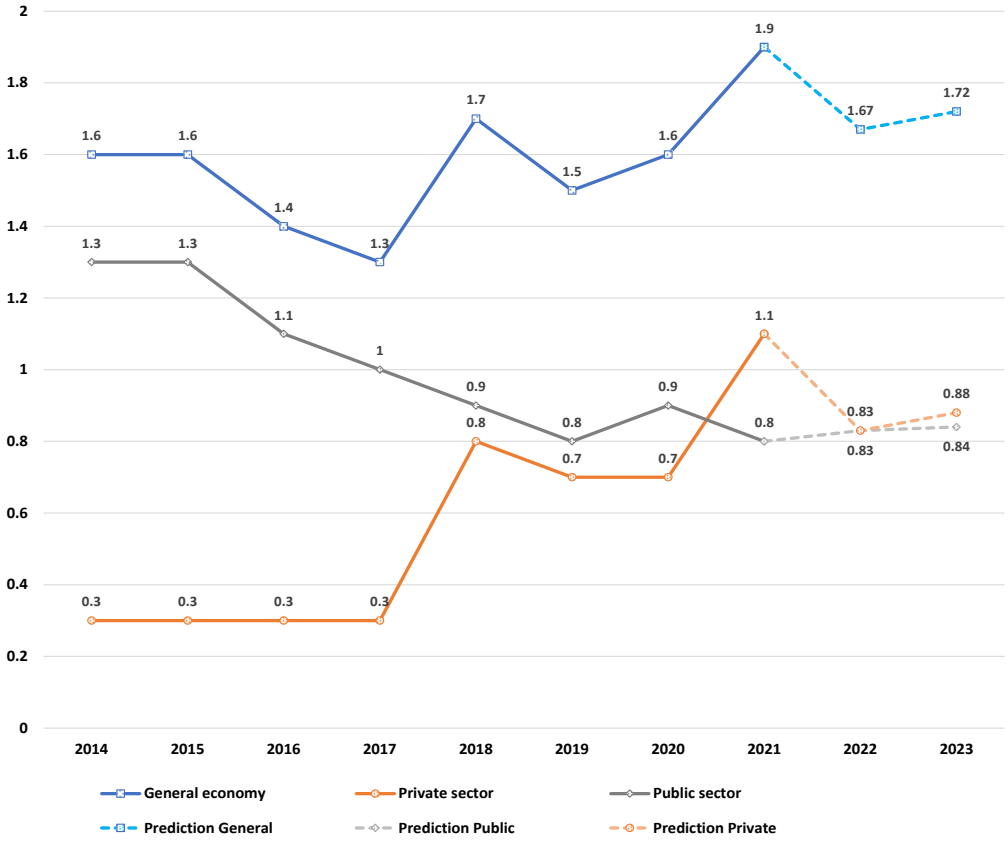

Figure 2. Changes in expenditures for environmental protection in Lithuania in 2015 - 2019 (as a percentage of GDP)
Source: compiled by the authors based on Eurostat data

Evaluating the amount of expenditure allocated in Lithuania according to the country's GDP, it can be seen that it is the second among all analyzed Baltic countries (Figure 2). As a result, it is not surprising that in 2019, Lithuania was in nineteenth place in the EU in terms of the number of investments allocated to environmental protection. However, it is worth noting that Lithuanian private companies started spending drastically more from 2017, while the public sector devoted a smaller and smaller share of GDP to environmental protection every year. Since 2019, however, a significant increase in the value of environmental protection expenditure in Lithuania has been noticed, in 2019 it has increased even to the level of 1.9 [%] GDP. The forecast determined by the moving average method with a smoothing period of 3 years past observations predicts that in the following years 2022 - 2023 expenditures will be about 1.6-1.7 [%] GDP. A significant increase in expenditure in the private sector is also characteristic, from a negligible level of 0.3 [%] in 2014-2017 to even 1.1 [%] in 2021. Forecasts indicate a slight decrease in these expenditures in the next 2 years to the level of approx. 0.8 [%] of GDP. A decrease in this expenditure in the public sector from 1.3 [%] in 2015 to 0.8 [%] in 2021 is also symptomatic. Forecasts show that these expenditures will remain stable in the next 2 years at approx. 0.85 [%] of GDP.

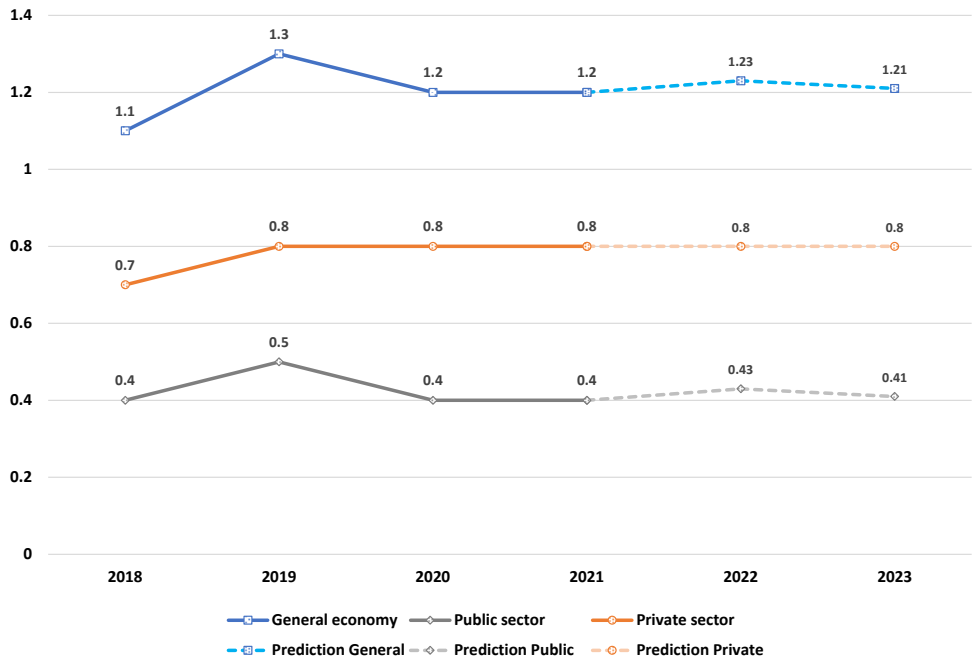

Figure 3. Changes in expenditures for environmental protection in Latvia in 2018 - 2021 and predictions for 2022 – 2023 (as a percentage of GDP)
Source: compiled by the authors based on Eurostat data

Analyzing Latvia's expenses for environmental protection (statistical data availability from Eurostat only from 2018 year), it is noticed that this indicator is lower than Estonia's and Lithuania's. Latvia's total expenditure on environmental protection was just under 1.5% of GDP. Analyzing the expenditure in the public and private sector on environmental protection in Latvia, it can be seen that it remains at a relatively constant level of 0.7-0.8 [%] of GDP for the private sector and at the level of 0.4-0.5 [%] of GDP for the public sector. Expenditure in the private sector exceeds twice that of the public sector, but in recent years it has still been at a lower level than in Lithuania and Estonia. It can be assumed that the government's low interest in environmental protection led to the fact that in 2019 Latvia's expenses for environmental protection were in fourteenth place among all EU countries (Eurostat, 2022). Forecasts determined by the moving average method show further stable financing in the general economy at the level of over 1.2 [%] and 0.8 [%] in the private sector and over 0.4 [%] in the public sector (Figure 3).

Analyzing the public and private sector expenditure on environmental protection in Estonia, one can see a decrease in total financing in the entire economy from 2.9 [%] of GDP in 2015 to 2 [%] in 2021 (Figure 4). However, this is still the best result of all three Baltic countries analyzed. Financing in the public sector remains relatively stable at the level of 0.6 – 0.8 [%] of GDP, while in the private sector there was also a decrease from 2.1 [%] in 2015 to 1.3 [%] in 2021. Forecasts predict a slight increase in financing for environmental protection both in the private sector to the level of 1.41 – 1.43 [%] and in the public sector to the level of 0.73 – 0.74 [%] GDP in the next two years 2022 – 2023. However, it should be noted that in 2019, the EU was in eighth place among all the countries of the state when assessing the overall average of Estonia for environmental protection (Eurostat, 2022). Meanwhile, the overall European average remained in eleventh place. This shows that Estonia spends more on environmental protection than most countries, including Sweden, Denmark, France, Spain - countries with stronger economies.

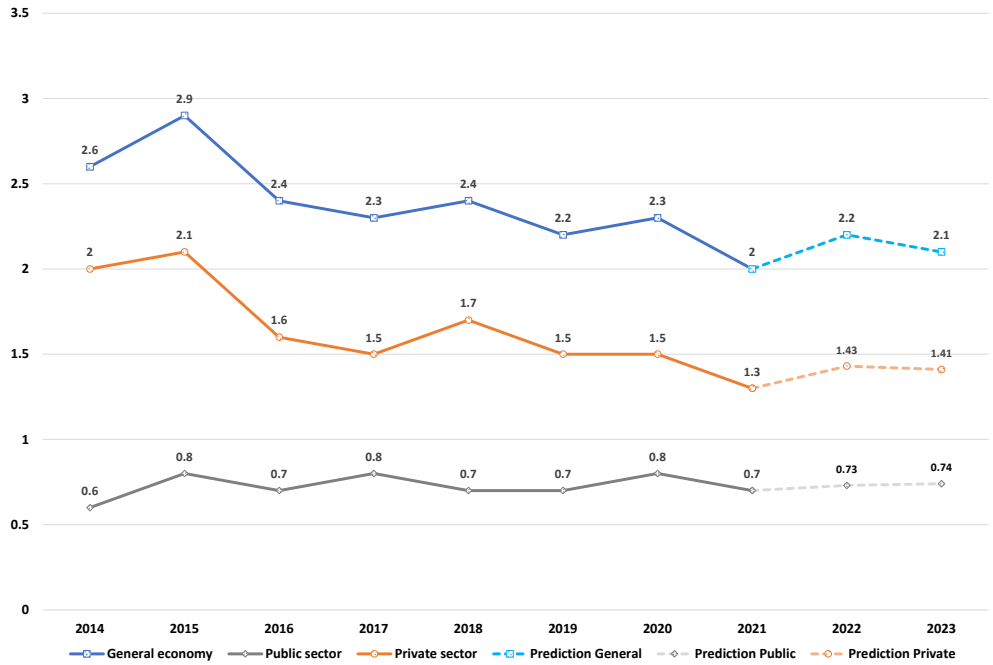

Figure 4. Changes in expenditures for environmental protection in Estonia in 2014 – 2021 and predictions for 2022 – 2023 (as a percentage of GDP)
Source: compiled by the authors based on Eurostat data

Another indicator that is relevant and related to sustainability, its promotion and cultivation is the expenditure on scientific research and experimental development to achieve sustainability goals. General national spending on research and development is important not only for the promotion of environmental research, but also for the faster implementation of EGD goals. The indicator measures the country's total expenditure on research and experimental development as a percentage of the country's GDP. This indicator includes research and experimental development expenditures by business enterprises, higher education institutions, as well as public and private non-profit organizations.

Research and experimental development entail both creative and systematic endeavors aimed at expanding the body of knowledge across various domains, including humanity, culture, and society. Additionally, they involve the exploration of novel applications for existing knowledge. (Commission Implementing Regulation (EU 2020/1197) of 30 July 2020 d. Appendix IV, p. 99). Such studies are extremely important when it comes to protecting the environment and reducing the greenhouse effect. The purpose of such research is to quickly establish new, environmentally friendly industrial methods that would not only protect the environment, but also contribute to the sustainable growth of society. The 2014-2021 period was chosen when assessing how much the studied countries invest in this area. The data are expressed as a percentage of GDP, at the same time distinguishing not only the total share allocated by all sectors, but also state and business sector investments.

From the presented diagram (Figure 5) it can be seen that the total average of expenditures for scientific research in Lithuania is lower than 1.2% of GDP. However, there is a general upward trend since 2016. The same growth trend is observed in the private sector. In all analyzed years, expenses in the private sector exceed expenses in the public sector. Evaluated forecasts in the period 2022 - 2023 shows further stable financing of R&D expenditures in general economy at the level of about 1.1 [%] of GDP and in the private sector over 0.5 [%] and in the public sector 0.18 [%]. However, it should be noted that although it can be seen that every year in Lithuania slightly more expenses are allocated to sustainable scientific

research, the public sector is gradually reducing these expenses. For this reason, Lithuania was in the twenty-first place among European countries in 2020 in terms of spending on scientific research (Eurostat, 2022). Lithuania's expenditure in this sector was twice as low as the overall EU average.

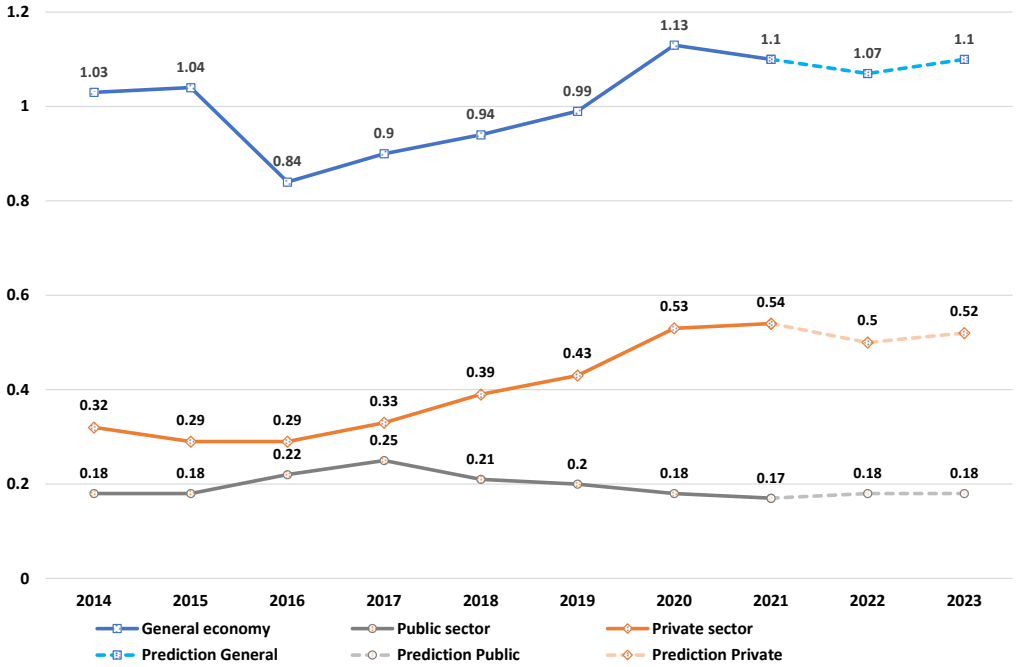

Figure 5. Investments in research and experimental development in Lithuania in 2014 - 2021 (percent) GDP
Source: compiled by the authors based on Eurostat data

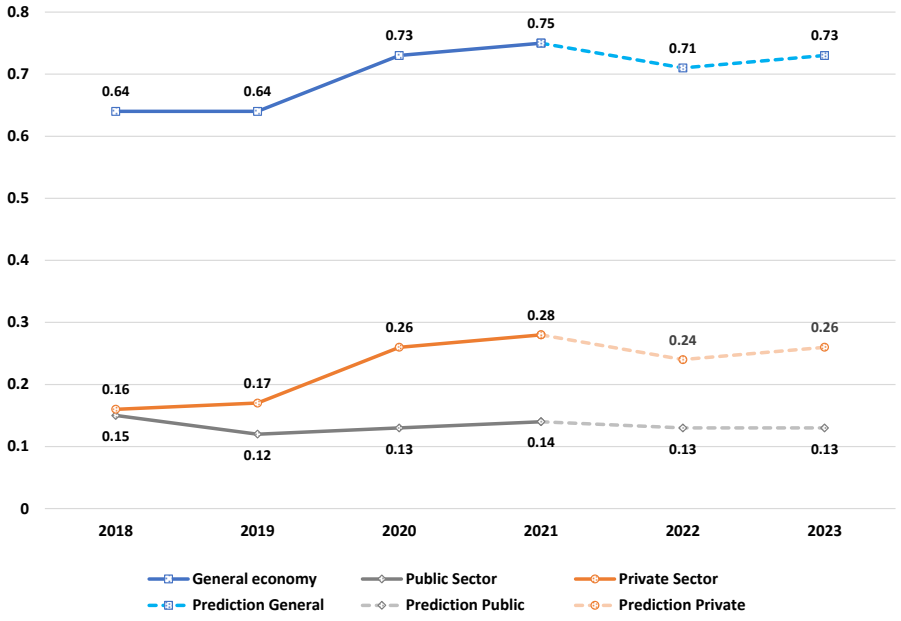

Figure 6. Investments in research and experimental development in Latvia in 2015 - 2020 (in percent) GDP
Source: compiled by the authors based on Eurostat data

Analyzing the case of Latvia, the presented diagram (Figure 6) shows that this country's investments in sustainable scientific research and experiments are lower than Lithuania's. From

2018 to 2021, these investments accounted for 0.64% of Latvia's GDP in 2018 and increase to 0.75 [%] GDP in 2021. Forecasts show that this investment will remain stable at the level of 0.71 - 0.73 [%] in 2022 – 2023. R&D expenditure in Latvia is also higher in the private sector than in the public sector. In 2021, they were twice as high and reached the level of 0.28 [%] GDP compared to public sector expenditure only 0.14 [%]. Forecasts show that this financing will remain at a similar level in the next two years 2022 - 2023. When evaluating Latvian investments, a similar trend is noticeable as in Lithuania: the private sector increases investments in research every year, while the public sector rather stabilizes at constant level. This is also influenced by the fact that Latvia allocates three times less to sustainable research than the overall EU average (Eurostat, 2022).

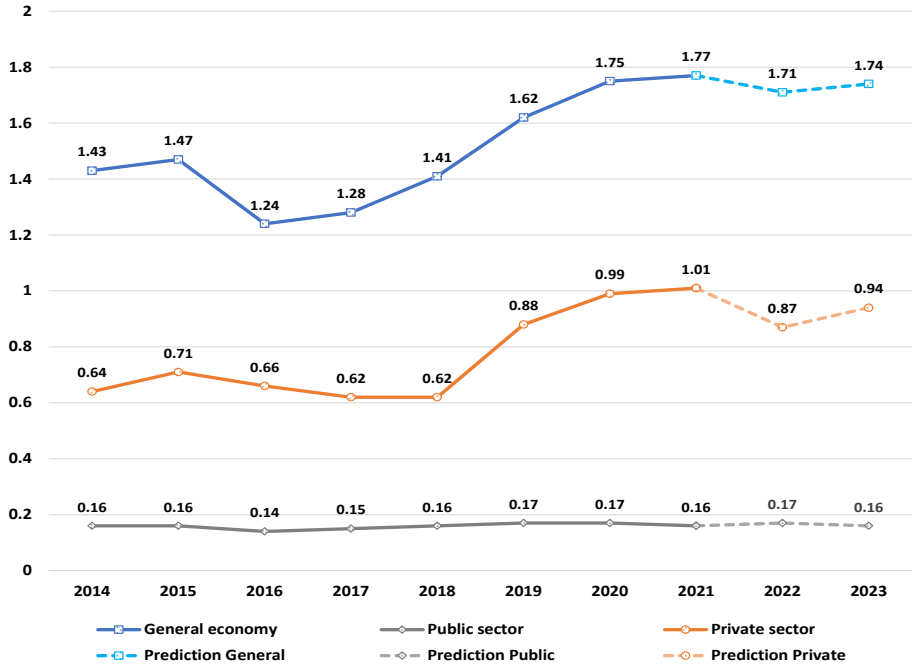

Figure 7. Investments in research and experimental development in Estonia in 2015 - 2020 (in percent) GDP
Source: compiled by the authors based on Eurostat data

Estonia, for its part, is the largest provider of investments in sustainable experiments and scientific research among the Baltic countries. It ranks twelfth in the EU in terms of allocated expenses. Although this country allocates a relatively large percentage of its country's GDP, it is worth highlighting the fact that in this country there is a greater gap between private and public sector expenditures (Figure 7). The difference between public and private sector investments in 2020 was as much as 5.4 times (Eurostat, 2022). This shows that private individuals are more willing to invest in research that will contribute to environmental conservation in the future than the government. Private sector financing is projected to decrease slightly to 0.87 % in 2022 and 0.94 % in 2023. Similarly, in the general entire economy, to the level of 1.71 [%] in 2022 and 1.74 [%] in 2023. On the other hand, in the public sector, expenditures will remain unchanged, stable and oscillate around 0.16 - 0.17 [%].

In order to assess how the countries under analysis are pursuing the implementation of EGD goals, it is useful to analyze their efforts to enable renewable energy resources as well. During the research, it was appropriate to analyze the extent of the use of renewable energy in the Baltic States. This indicator measures the share of renewable energy in the total final energy consumption according to the "Renewable Energy Directive". Renewable energy sources are

described as self-replenishing (or renewable). Typical examples of such energy are solar, wind, hydro, geothermal, biomass, and liquid or gaseous biofuels. Total final energy consumption is the energy used by end-users (e.g. households, services, industry and agriculture) plus grid losses and consumption of renewable power plants for own purposes.

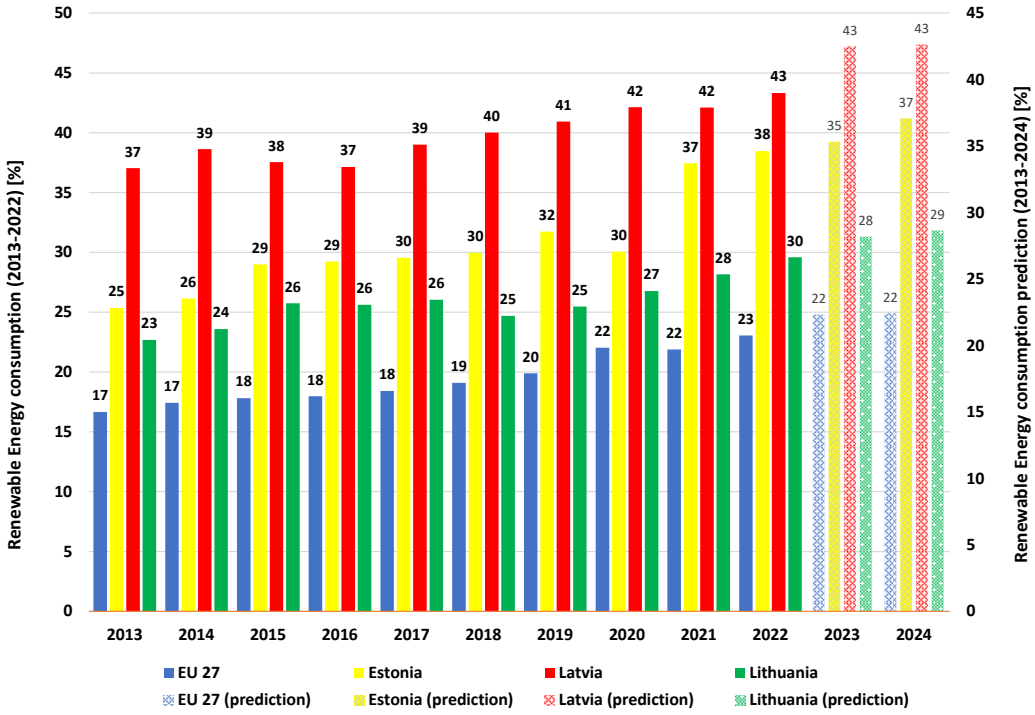

Figure 8. Renewable energy consumption in the EU, Lithuania, Latvia and Estonia in 2013 - 2023 (percent) and predictions for 2023 - 2024
Source: compiled by the authors based on Eurostat data

The diagram (Figure 8) presents the general statistics of the countries under study and compares them with the overall EU indicator. According to the data presented, it can be seen that more and more energy from renewable sources is consumed every year. Latvia consumes the most of this energy, Estonia is in second place, and Lithuania is in third place. It should be noted that the indicators of all countries in terms of consumed energy from renewable energy sources are even several times higher than the overall EU average. This is also reflected in the general statistics of the EU. In 2020, Latvia was the third EU country that rapidly uses renewable energy sources, Estonia remained in eighth place, and Lithuania in ninth place (Eurostat, 2022).

Further, in the work, it was chosen to simultaneously analyze how GDP, CO2 gas emissions and exploited natural resources correlate with each other. Research shows that a larger gap between GDP and decreasing environmental damage indicates more sustainable economic growth. At the heart of the new Sustainable Development Goals is the idea that economic growth (defined as cash flow or market value) can be “decoupled” from physical economic growth (resource consumption) and associated environmental impacts (degradation, pollution) (Fletcher and Rammelt, 2017).

The notion of "decoupling" has emerged as a focal point in the global development discourse since 2015. This concept gained prominence with the endorsement of former UN Secretary-General Ban Ki-Moon in the introduction to the Sustainable Development Goals. The United Nations Environment Program (UNEP) has championed the decoupling concept, particularly through two key reports: "Decoupling Natural Resource Use and Environmental

Impacts from Economic Growth" (2011) and "Decoupling 2: Technologies, Capabilities and Policy Options" (2014).

The United Nations Environment Program begins its analysis with a fundamental differentiation between economic growth and physical growth. Initially, it focuses on the expansion of GDP or a comparable metric of economic value, encompassing the material inputs that underpin this value. The argument for exclusion is built upon several critical conceptual distinctions, the primary one being between relative and absolute separation. Relative separation UNEP 2011 the report defines it as a reduction in the "rate of (primary) resource use per unit of economic activity", while absolute decoupling describes the overall reduction in resource use even when economic growth is observed (Fletcher and Rammelt, 2017). The second major difference in 2011 the report is between resource (i.e. inputs) and impact (i.e. output) decoupling, where "resource decoupling could be referred to as increasing resource productivity and impact decoupling as increasing eco-efficiency". The third distinction made by the United Nations Environment Program is between tangible and intangible resources: the former are those "whose value is defined by the properties that make them useful for certain uses", the latter - those "whose use does not affect the properties that make them useful" (Fletcher and Rammelt, 2017).

Thus, the goal is to promote "intangible economic growth," a dynamic otherwise known as dematerialization. In this way, the United Nations Environment Program asserts that "it is conceptually possible for economic growth (now defined as cash flows or value) to be decoupled from physical economic growth (resource consumption) and associated environmental pressures" (Fletcher and Rammelt, 2017).

Decoupling is not only possible but, according to the United Nations Environment Programme, necessary given environmental constraints. The United Nations Environment Program clearly recognizes "the limits of natural resources to support human development and economic growth," but insists that growth is still needed "to create jobs for the soon-to-be two billion unemployed or underemployed people." Thus, exclusion is considered "a necessary condition for reducing the level of global inequality and ultimately ending poverty", but without going beyond the limits of biophysical resources. In order to assess the gap, three indicators were chosen: the country's GDP, CO2 gas emissions in the country and the use of natural resources. The CO2 index measures human emissions of greenhouse gases, as well as emissions of so-called Kyoto basket greenhouse gases. Because the greenhouse effect is produced by different gases, scientists have integrated them into a single indicator, greenhouse gas emissions expressed in units of CO2 equivalent, using the global warming potential of each gas. Greenhouse gas emissions data are provided for six sectors - (1) energy, (2) industrial processes and product use, (3) agriculture, (4) land use, land-use change and forestry, (5) waste management and (6) other sectors. The natural resource utilization rate is calculated by dividing GDP by domestic material consumption. Domestic material consumption quantifies the total materials directly utilized within a country's economy. This metric comprises the annual quantity of raw materials extracted from the country's domestic territory, in addition to all physical imports and subtracting all physical exports. Notably, "consumption" in this context denotes apparent consumption, not final consumption. Resource utilization excludes flows associated with the import and export of raw materials and products originating from outside the local economy.

First of all, the overall EU indicator was evaluated, which is used as a starting point in the work. From the presented diagram, it can be seen that since 2015, more natural resources have been exploited in the EU. It is known that today various mining and extraction of these resources strongly contribute to increasing the greenhouse effect. This is also reflected in the presented diagram (Figure 9). It can be seen that the higher use of resources also supports the

high amount of CO2 emissions, which is a direct cause of the greenhouse effect. However, it must be noted that after the entry into force of the EGD in 2019, this curve began to gradually decrease. When assessing the gap between European GDP and the positive impact on the environment - the reduction of CO2 emissions - a slight increase in the gap is also observed. In 2015, the gap was 29 points, while in 2022 it reached 49 points. This growth shows that Europe as a continent is gradually moving towards sustainable economic growth.

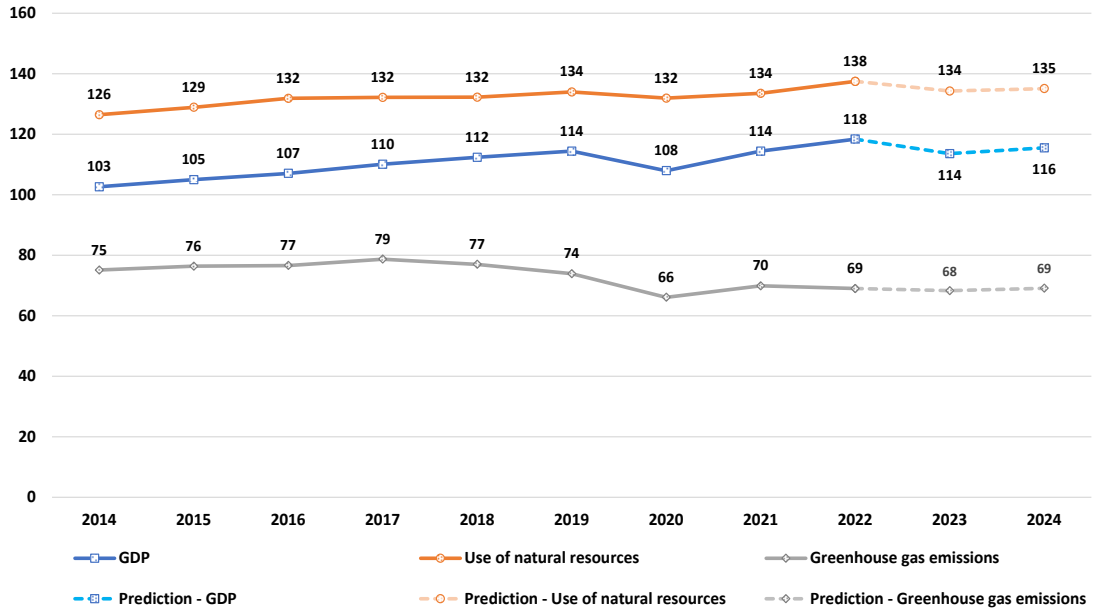

Figure 9. Gap between GDP, the use of natural resources and greenhouse gas emissions in EU 27 member states in 2014 – 2022 and predictions (moving average method) for 2023 – 2024
Source: compiled by the authors based on Eurostat data

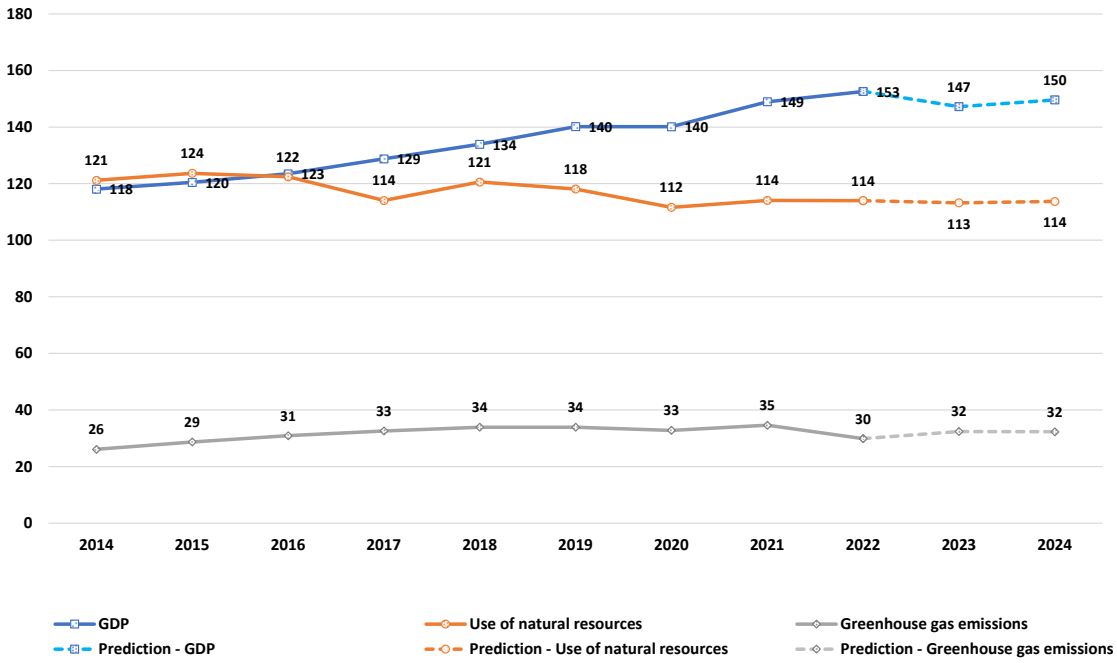

Figure 10. Difference between GDP, the use of natural resources and greenhouse gas emissions in Lithuania in 2014 – 2022 and predictions (moving average method) for 2023 – 2024
Source: compiled by the authors based on Eurostat data

When evaluating the indicators obtained for Lithuania, a very large gap between GDP and CO_2 emissions is noticeable. This means that Lithuania is one of the most sustainable Baltic states. In terms of CO_2 emissions, Lithuania's average is the lowest in the entire EU. Analyzing each indicator of Lithuania separately, it is noticeable that the amount of CO_2 emissions increased by 9 points from 2014 to 2021. Meanwhile, the use of natural resources decreased by 7 points, while GDP increased by 31. The widening gap between increased GDP and decreased resource use also points to positive growth in the sustainable economy.

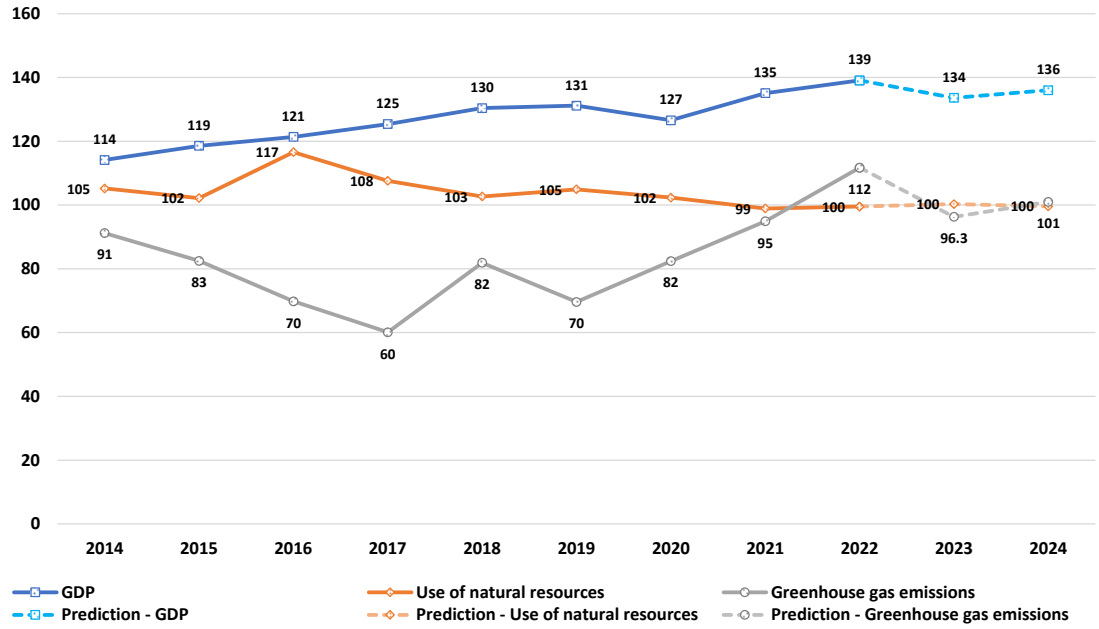

Figure 11. Gap between GDP, the use of natural resources and greenhouse gas emissions in Latvia in 2014 – 2022 and predictions (moving average method) for 2023 – 2024
Source: compiled by the authors based on Eurostat data

When evaluating Latvian indicators, it can be seen that CO_2 emissions are in a similar range to the EU average. However, this indicator is not stable and there is no visible gradual increase or decrease. Quite the opposite situation is observed with Latvia's GDP and the number of the use of natural resources. Since 2016, GDP growth and resource extraction have been observed in Latvia. This means that the amount of CO_2 emissions in Latvia is not directly dependent on the method of obtaining resources. When assessing the gap between the country's GDP and the improvement of environmental protection, it was 37 points in 2015, and 49 in 2020 (Eurostat, 2022). Assessing this gap, it can be said that sustainable economic growth is also taking place in Latvia, but it is necessary to keep in mind that it is not stable due to the instability of CO_2 emissions. It is worth noting that in the absence of a stable decrease in CO_2 emissions, Latvia's indicator in the EU is slightly lower than the overall EU average and in 2020 it was in tenth place in terms of CO_2 emissions.

When assessing Estonia's indicators, a larger gap between the country's GDP and CO_2 emissions is visible. In 2015, it was 64 points, and in 2020 - 102. The presented diagram shows not only the steady growth of GDP, but also the steady decrease of CO2 emissions since 2017. Meanwhile, when analyzing the number of the use of natural resources in the country, it can be seen that this indicator remains similar throughout the analyzed period, but it is worth emphasizing that it has little influence on CO_2 emissions. This means that Estonia uses cleaner and more ecologically friendly methods of resource extraction than other EU countries. This is

also reflected in the general EU statistics, which showed that in 2020, Estonia was in third place in terms of CO_2 emissions, which is almost twice as good as the overall EU average (Eurostat, 2022).

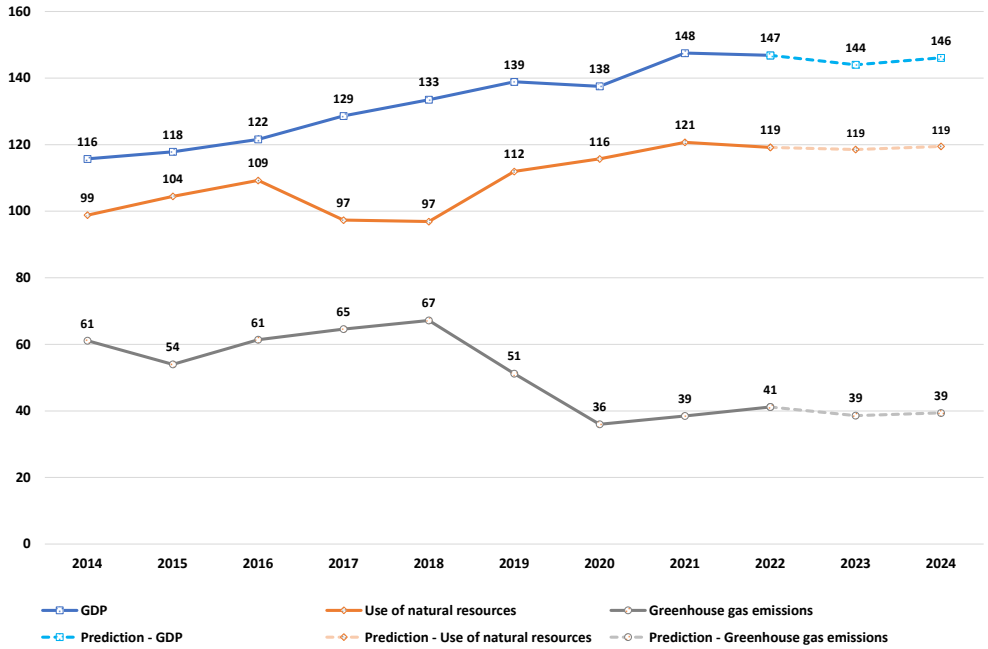

Figure 12. Gap between GDP, the use of natural resources and greenhouse gas emissions in Estonia in 2014 – 2022 and predictions (moving average method) for 2023 – 2024
Source: compiled by the authors based on Eurostat data

The last stage of the study was to perform a comparative analysis of the adaptation of the economies of the surveyed 3 Baltic countries to the requirements included in the EGD compared to the other 27 EU countries. For this purpose, a ranking of all 27 EU countries was determined, where 10 indicators describing: expenditure on environmental protection, expenditure on research and development of new technologies in science and industry, change in the level of GDP, use of energy from renewable sources and consumption in the economy of natural resources (non-ecological) were adopted as diagnostic variables. The survey was conducted for 2021 (the latest statistical data available in the Eurostat database for all indicators).

The following 10 indicators were selected as diagnostic variables:

X_1 - National expenditure on environmental protection - general government [%] GDP

X_2 - National expenditure on environmental protection - corporations [%] GDP

X_3 - National expenditure on environmental protection - households [%] GDP

X_4 - GERD (Gross Domestic Expenditure on Research and Development) - enterprise sector [%] GDP

X_5 - GERD - government sector [%] GDP

X_6 - GERD – higher education sector [%] GDP

X_7 - Resource productivity chain index - use of natural resources (2000 base year)

X_8 – GDP at market price chain index (2010 base year)

X_9 – Net greenhouse gas emissions chain index (1990 base year)

X_{10} – Share of energy use from renewable sources [%]

Two of the selected indicators (X_7, X_9) were treated as destimulants in the context of EGD implementation, the remaining diagnostic variables were stimulants. The values of selected indicators are presented in Table 1. The values of the coefficients of variation for the

selected diagnostic variables $V_\sigma > 10$ [%], so the selected variables will differentiate well between the studied EU countries. The values of linear correlation coefficients between pairs of the selected variables for the study were also determined in order to exclude their possible collinearity. The results of the calculations are presented in Table 2. On the basis of the analysis of the determined correlation coefficients, it can be stated that there are no very significant collinearities for each pair variables ($|\rho| < 0.73$).

Table 1. Statistical data and descriptive statistics for the selected indicators

Country	X_1	X_2	X_3	X_4	X_5	X_6	X_7	X_8	X_9	X_{10}
Belgium	1.3	1.7	0.3	2.56	0.29	0.56	156.5	115.7	78.4	13.00
Bulgaria	0.6	1.1	0.3	0.51	0.21	0.05	125.8	124.8	54.9	19.45
Czechia	1.2	1.5	0.4	1.25	0.33	0.41	180.4	122.1	65.5	17.67
Denmark	0.3	1.1	0.7	1.72	0.09	0.94	126.5	122.1	56.2	41.01
Germany	0.4	1.5	0.4	2.09	0.46	0.57	151.7	115.6	60.2	19.39
Estonia	0.7	1.1	0.2	0.99	0.16	0.59	120.7	147.5	38.5	37.44
Ireland	0.5	0.3	0.1	0.89	0.04	0.18	318.9	216.2	110.4	12.38
Greece	0.8	0.1	0.4	0.69	0.32	0.44	144.4	83.6	72.5	22.02
Spain	0.6	0.9	0.3	0.79	0.24	0.38	198.9	104.5	96.6	20.74
France	0.8	0.7	0.5	1.46	0.26	0.45	140.5	111.1	75.7	19.20
Croatia	1	0.5	0.5	0.58	0.26	0.4	115.4	117.4	77.2	31.28
Italy	0.7	1.3	0.5	0.86	0.2	0.34	151.2	99.5	75.2	18.88
Cyprus	0.3	0.8	0.2	0.34	0.05	0.31	157.6	122.7	147.2	19.07
Latvia	0.4	0.5	0.4	0.28	0.14	0.33	98.9	135.1	94.9	42.09
Lithuania	0.8	0.8	0.2	0.54	0.17	0.39	114.1	148.9	34.6	28.17
Luxembourg	0.3	0.4	0.2	0.53	0.25	0.26	129.3	130.8	81.2	11.73
Hungary	0.5	0.5	0.3	1.24	0.17	0.23	145.1	133.3	61.7	14.13
Malta	1.7	0.4	0	0.42	0.01	0.22	127.6	177.4	83.4	12.67
Netherlands	1.4	0.3	0.2	1.5	0.12	0.65	159.8	116.3	76.8	12.99
Austria	0.2	3.1	0.3	2.25	0.25	0.75	122.2	111.2	98.9	34.57
Poland	0.2	1.6	0.7	0.9	0.03	0.5	164.8	146.3	84.2	15.61
Portugal	0.4	1.1	0.3	1	0.08	0.56	137.3	103.7	77.3	33.98
Romania	0.9	1.3	0.3	0.29	0.14	0.04	64.9	143.2	29.1	23.87
Slovenia	0.4	1.4	0.5	1.56	0.29	0.26	185.7	123.7	109	25
Slovakia	0.9	0.7	0.3	0.51	0.17	0.23	173.7	128.1	52.7	17.42
Finland	0.5	1	0.4	2.05	0.22	0.69	93.2	109.5	105.6	42.85
Sweden	0.8	0.9	0.4	2.46	0.15	0.78	100.1	125.9	24.2	62.69
Mean $\bar{X}$	0.69	0.98	0.34	1.12	0.19	0.43	144.6	127.3	74.9	24.8
Standard deviation σ	0.38	0.62	0.17	0.65	0.11	0.21	47.8	26.6	28.3	12.5
Coefficient of variation $V_\sigma = \frac{\sigma}{\bar{X}} \cdot 100$ [%]	54.6	62.6	48.2	57.7	56.6	50.2	33.1	20.9	37.7	50.6

Source: Author's own calculations based on Eurostat data

Table 2. Correlation table for the pairs of selected indicators

Pearson's correlation coefficient ρ	X_1	X_2	X_3	X_4	X_5	X_6	X_7	X_8	X_9	X_{10}
X_1	1.00	-0.28	-0.38	-0.03	0.00	-0.13	-0.06	0.10	-0.29	-0.25
X_2	-0.28	1.00	0.28	0.51	0.26	0.33	-0.13	-0.22	0.01	0.16
X_3	-0.38	0.28	1.00	0.27	0.23	0.39	-0.17	-0.46	-0.08	0.30
X_4	-0.03	0.51	0.27	1.00	0.38	0.72	-0.01	-0.28	-0.06	0.33
X_5	0.00	0.26	0.23	0.38	1.00	0.09	-0.07	-0.55	-0.12	-0.05
X_6	-0.13	0.33	0.39	0.72	0.09	1.00	-0.20	-0.37	-0.08	0.57
X_7	-0.06	-0.13	-0.17	-0.01	-0.07	-0.20	1.00	0.39	0.43	-0.51
X_8	0.10	-0.22	-0.46	-0.28	-0.55	-0.37	0.39	1.00	0.00	-0.19
X_9	-0.29	0.01	-0.08	-0.06	-0.12	-0.08	0.43	0.00	1.00	-0.26
X_{10}	-0.25	0.16	0.30	0.33	-0.05	0.57	-0.51	-0.19	-0.26	1.00

Source: Author's own calculations based on Eurostat data

The values of the selected diagnostic indicators were used to determine the ranking of EU countries using the linear ordering methodology with TOPSIS synthetic measure described in details in the research methodology section of this publication (with the use of transformations described by formulas (1) – (7)). Summary results for the ranking of EU 27 countries are presented in Table 3.

Table 3. TOPSIS aggregate measure values and ranking for the 27 EU countries in 2021

Country	TOPSIS (R_i)	Ranking
Sweden	0.6104	1
Denmark	0.5410	2
Austria	0.5324	3
Belgium	0.5288	4
Germany	0.5241	5
Finland	0.5058	6
Czechia	0.4883	7
Estonia	0.4879	8
Croatia	0.4561	9
France	0.4551	10
Romania	0.4462	11
Lithuania	0.4442	12
Netherlands	0.4273	13
Poland	0.4257	14
Slovenia	0.4212	15
Italy	0.4104	16
Greece	0.4040	17
Latvia	0.3982	18
Portugal	0.3972	19
Malta	0.3937	20
Bulgaria	0.3841	21
Hungary	0.3775	22
Slovakia	0.3766	23
Spain	0.3397	24
Luxembourg	0.3380	25
Ireland	0.3000	26
Cyprus	0.2522	27

Source: Author's own calculations based on Eurostat data

Comparing of the three Baltic countries surveyed, Estonia was ranked highest (8th position in the ranking). It was overtaken by only seven countries (these are countries such as Sweden, Denmark, Austria, Finland, Germany), which have a relatively high national income GDP, focus on the development of new technologies in the so-called low-emission industry, take care of their environment through appropriate financing and use a lot of alternative renewable energy sources, which is mainly pointed out by EGD. Lithuania was ranked 12th in the middle of the ranking, while Latvia was only 18th in the ranking. Among all EU countries, the worst are countries such as: Cyprus, Ireland, Luxembourg, Spain.

5. Conclusions and policy implications

The European Green Deal is a long-term process, the main goal of which is a more sustainable future for society. This goal can only be achieved with a holistic, all-encompassing approach. Certain investment systems and regulations have been created in order to implement the objectives of the European Green Deal. Sustainable finance plays a key role in this, as the objectives are focused on sustainable investments and a more sustainable society.

Sustainable finance includes environmental, social, and governance aspects that, in turn, work as one to help create a more sustainable society. Because sustainable finance is still a relatively new field of finance, the term, possibilities of use, and its importance are not yet precisely defined. However, based on scientific research, it can be stated that the concept of sustainable finance is closely related to the reduction of environmental threats and the growth of social sustainability. At present, sustainable finance is mainly used as a tool to implement various environmental protection programs and strategies. Systematic increase in sustainable financing is expected to result in a stable transition of society towards sustainability and the implementation of new, environmentally friendly projects.

Sustainable finance in Europe covers an ever-increasing range of areas of use and enables the creation of new financing systems. This financing concept is gaining more and more interest from the private and public sectors every year due to its emphasis on environmental protection, as continuous investments in more sustainable and environmentally friendly projects are strongly encouraged. Green bonds are also gaining more recognition in Europe as one of the main instruments of sustainable finance. Sustainable finance initiatives can be managed by following a strategic action plan which includes guidelines for its use. Despite the differences in financial power across countries, the advantages and disadvantages of sustainable finance remain noticeably similar everywhere. The potential of sustainable finance is quite vast, and it is highly flexible. However, the high rewards of sustainable finance also entail risks. Most investors are afraid to take a leap and allocate more funds to sustainable projects as, for now, there is no strong and clear regulatory system that would cover not only the benefits of sustainable finance, but also its risks and their management.

The study did not show a strong relationship between the allocation of sustainable finance for environmental protection and the implementation of EGD goals. Nevertheless, a very strong connection was found between the allocation of sustainable finance for research and development, the promotion of the use of renewable energy resources, and the implementation of EGD goals. The favorable formation of public opinion also contributes to the increased use of renewable energy resources, which, in turn, is directly related to the reduction of CO_2 emissions, reduced depletion of natural resources, increased economic well-being of the society, and the implementation of EGD goals.

The conducted analysis indicates that Estonia is the best country at adapting its economy to the EGD requirements among the Baltic countries. Its high position in the research ranking

is the proof of this. Meanwhile, Lithuania is doing much worse with this approach, and Latvia is the worst of all surveyed Baltic countries.

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