**ENTREPRENEURSHIP AND
SUSTAINABILITY CENTER**

**enterprise
europe
network**
Business Support on Your Doorstep

CASPA

Web of Science

**Clarivate
Analytics**

GREEN ECONOMY: CONTENT AND METHODOLOGICAL APPROACHES[*]

Olga Lavrinenko [1], Oleg Rybalkin [2], Alina Danileviča [3], Marija Sprūde [4]

[1,2,3] Daugavpils University, Institute of Humanities and Social Sciences, Parades Str. 1-421, Daugavpils, LV-5401, Latvia
[4] Daugavpils University, Faculty of Humanities, Vienibas Str. 13, Daugavpils, LV-5401, Latvia

E-mails: [1]olga.lavrinenko@du.lv; [2]oleg.rybalkin@gmail.com; [3]alina.danilevica@du.lv; [4]marija.sprude97@gmail.com

Abstract. The existing economic development model needs to fit into the sustainable development framework due to the continuing depletion of natural resources and the continuing disproportions in economic growth. Therefore, a new concept was introduced, a "green economy", which emphasises improving the population's quality of life while minimising the use of resources and preserving nature for subsequent generations. However, discussions about the green economy measurement methodology continue. Based on the literature analysis, the authors clarified approaches towards the concept under consideration. They developed a novel approach to a green economy in the context of the basic principles of sustainable development.

Keywords: green economy; sustainable development; methodology; indexes

1. Introduction

A series of global forums in the second part of the 20th century and the beginning of the 21st century devoted to sustainable development stimulated scientific interest. Sustainable development as a concept burst into scientific considerations of a broad spectrum of disciplines in the late 1980s due to the publication of the report "Our Common Future" in 1987. The report summarised the achievements and failures of humanity in the 20th century identifying sustainable development as a possible way of improving the existing situation (Brundtland, 1987).

What the Brundtland Report defined as "Our Common Future" received an institutional framework with the adoption of Millennium Development Goals (MDGs) in 2000, and what is more important – Sustainable Development Goals (SDGs) set by the United Nations General Assembly in 2015, developed as a result of Rio+20 conference (the United Nations Conference on Sustainable Development, UNCSD) held in 2012. Two agenda items for Rio+20 were: "Green Economy in the Context of Sustainable Development and Poverty Eradication" and "International Framework for

---

Sustainable Development". As we see, the term green economy was used in the context of sustainable development. The paper's authors adopt the same approach and focus on the green economy content and its measurement in the context of sustainable development.

As mentioned above, moving towards a green economy has become a strategic policy agenda for sustainable development. A green economy recognises that the goal of sustainable development is improving the quality of human life within the constraints of the environment, which include combating global climate change, energy insecurity, and ecological scarcity. However, a green economy must be focused on more than eliminating environmental problems and scarcity. It must also address the concerns of sustainable development with intergenerational equity and eradicating poverty (UNEP, 2011).

The European Union has contributed significantly to the activities of international structures related to sustainable development. The EU countries have hosted most of the decisive environmental forums. The European Commission finds the green economy to be more than a sum of existing commitments. It has the potential to introduce a new development paradigm and a new business model in which growth, development, and the natural environment are deemed mutually supportive. Increasing resource efficiency, promoting sustainable consumption and production, preventing climate change, protecting biodiversity, combating desertification, reducing pollution, and managing natural resources and ecosystems in a responsible manner are necessities and a simultaneous driving force ensuring the transition to a green economy (Ryszawska, 2013; Kasztelan, 2021). Bogovic et al. (2020, p.1) "conclude that transitioning towards a green economy, i.e., implementing specific green economy policies, can push sustainable development in the EU while simultaneously contributing to the implementation of the strategic goals of the European Green Deal".

In line with the commitment to develop a green economy, the EU emphasises attaining Sustainable Development Goals (SDGs). The EU made a positive and constructive contribution to the development of the 2030 Agenda, is committed to implementing the SDGs in all policies and encourages EU countries to do the same (European Commission, 2022).

Against this background, it is notable that the analysis of existing literature has demonstrated that only a few scholars have conducted research dedicated to assessing the performance of the green economy in the European Union, especially in the context of sustainable development and SDGs. Such a state of affairs is discordant with the ambitious goals and political actions of the European Union in terms of the green economy.

A wide range of modern scientists worldwide is engaged in research on the theoretical and methodological basis of the green economy. Alcalde-Calonge et al. (2022, p.1). "the literature on the topic has grown from 12 scientific articles published in 2008 to 2355 in 2020, which represents an almost two hundredfold increase in around a decade". The fact that most natural resources are non-renewable, a significant increase in environmental damage, and the growth of the world population highlight the need to develop a green economy that promotes environmentally sustainable investments (Bergius et al., 2020).

With many countries striving to improve resource efficiency, introduce environmentally-friendly production methods, combat climate change etc., it is clear that the concept a green economy remains high on the agenda nowadays, especially taking into account the high energy prices the world economy is has faced recently.

Promoting a more resource-efficient, greener and more competitive economy was the priority for the EU, the "European Green Deal" – a plan to achieve carbon neutrality by 2050 outlined by European Commission in December 2019 (European Commission, 2020). Regions and many separate states also retain an interest in promoting greener economies on a national level.

Decision-makers in most European countries have acknowledged this imperative, which lies at the core of EU common policies and implement it on the country level through so-called National Energy and Climate Plans. These plans provide, among other things, targets for the decommissioning of those technologies that have a more profound impact on our carbon footprint and for the development of new renewable capacity.

Anyway, it must be admitted that a particular gap in the research on the green economy and its connection with the concept of sustainable development still exists: a scientific problem of measuring a country's/ region's progress towards a greener economy. Even though there are several models, as it will be shown further in this study, they seem to consider only some spheres related to the issue.

2. Evolution of green economy research in the context of sustainable development

Meaning, which different authors puts into "green economy", along with which accompanying definitions such as "green technologies", "eco-innovation", "green innovation", "and green growth", slightly differ.

Fulai (2010) claimed that green economy was typically understood as an economic system, which was compatible with the natural environment, was environmentally friendly, ecological, and for many groups, was also socially just. Others, such as the United Nations Economic and Social Commission for Asia and the Pacific (ESCAP), define green growth as a policy focus that emphasises "environmentally sustainable economic progress to foster low-carbon, socially inclusive development" (Greening the economy, 2011, p.3).

The definitions of "green growth" provided by the OECD are characterised by a broad approach described by promoting economic growth while reducing pollution and greenhouse gas emissions, as well as minimising waste and inefficient use of natural resources and conserving biodiversity (OECD, 2017).

Green growth can be defined as economic growth focusing on environmentally sustainable (safe for the environment) and socially inclusive development. The essential features of such change are that it does not affect the environment and does not ensure better economic prospects for contemporaries at the expense of future generations.

To reach green growth without hampering economic prospects (particularly the growth of GDP), humanity utilises green innovations, meaning the creation or implementation of new or modified processes, practices, systems and products which benefit the environment and contribute to environmental sustainability.

According to Swart and Groot (2020), the term "green economy" emphasises a friendly attitude toward the natural environment. Chavula et al. (2022) agree that a low-carbon, resource-efficient, and socially inclusive economy is referred to as green.

Other scientists pay special attention to the well-being aspect, claiming that "the green economy is an alternative vision for growth and development; one that can generate economic development and improvements in people's lives in ways consistent with also advancing environmental and social well-being" (Söderholm, 2020, p.1).

For Chen Lai et al. (Chen et al., 2006, p. 332), green innovation "is hardware or software innovation that is related to green products or processes, including the innovation in technologies that are involved in energy-saving, pollution-prevention, waste recycling, green product designs, or corporate environmental management.

Kemp et al. (Kemp and Pearson, 2007 p.7) associate green innovations with "the production, assimilation or exploitation of a product, production process, service or management or business method that is novel to the organisation (developing or adopting it) and which results, throughout its life cycle, in a reduction of environmental risk, pollution and other negative impacts of resources use (including energy use) compared to relevant alternatives".

Green innovations, according to Oltra and Saint Jean (Oltra and Saint Jean, 2009, p.567), "are innovations that consist of new or modified processes, practices, systems and products which benefit the environment and contribute to environmental sustainability".

Nuryakin et al. (2022, p.1) established "the mediating role of green product innovation and green product competitiveness advantage on green marketing performance".

Leal-Millán et al. (2017) claimed that green innovations contribute to creating products, services or processes while optimising the use of natural resources to improve human well-being and can also contribute to sustainable development".

Scientists claim that green innovations produce positive spillovers in both the introduction and diffusion stages; they are intrinsically more risky and uncertain than other investments because they involve technologies that are in the initial stage of their development and therefore suffer from the existence of increasing returns (from knowledge, competencies, and infrastructure) in established, carbon-intensive technologies; finally, the evolution of and frequent changes in environmental regulation make the profitability of the eco-innovative projects uncertain (Cecere et al. 2020; Andersén, 2021). As a result, green stocks may be very volatile in their market performance (Rybalkin, 2022). As it has already been stated, green innovations, irrespective of the economic sector introduced, are one of the main tools to facilitate green growth, which is also conducive to the green economy.

Similarly to green innovations, eco-innovations embrace "the introduction of any new or significantly improved product (good or service), process, organisational change or marketing solution that reduces the use of natural resources (including materials, energy, water and land) and decreases the release of harmful substances across the whole lifecycle" (Sobczak et al., 2022, p.1). The nature of the eco-innovations includes the product, process, and organisational eco-innovations (Eco-Innovation Observatory, 2012).

Eco-innovation is the creation or implementation of new or significantly improved products (goods and services), processes, marketing methods, organisational structures and institutional arrangements which – with or without intent – lead to environmental improvements compared to relevant alternatives.

Thus, the analysis performed by the authors of the present study shows that the green economy is an economic system that is compatible with the natural environment, is environmentally friendly, is ecological, and for many groups, and is also socially just – it can be regarded as the final goal of green growth.

How are the concepts of "green economy", "green growth", and "green innovation" related to the notion of "sustainable development"?

Sustainable development ensures economic growth, which makes it possible to harmonise human-nature relations and safeguard the environment for present and future generations (Vertakova et al., 2017).

Ryszawska identifies sustainable development (Ryszawska, 2015) as social, economic and political development to preserve the natural balance and environmental access for future generations.

The concept of sustainable development is usually considered from two perspectives. In a narrow sense, the focus is mainly on its ecological component. Still, in a broad sense, sustainable development is interpreted as a process that denotes a new type of civilisation functioning. Therefore, sustainable development can be seen as an objective requirement of our time (Medvedkina, 2020; Khan, 2021). Having emerged with Blueprint for a green economy for the UK's Department for the environment, the concept of sustainable development attracted the particular interest of researchers in the aftermath of the 2008–2009 global financial crisis, which, in the first place, made it apparent for decision-makers that studying this phenomenon is inevitable since there was an urgent need for the shift in the existing economic model and finding new ways of elaborating a new green economy paradigm. Fulai (2010), Oliinyk (2020), Trushkina (2022), for instance, articulate the relationships between the notion of a green economy with other related concepts such as a low-carbon economy, a circular economy, sustainable consumption and production (SCP), green growth, sustainable development, the Millennium Development Goals (MDGs) etc. Green economy can improve the growth of the country's economy and at the same time achieve sustainability goals (Alsmadi et al., 2022).

The one performed by Ryszawska (2017) possesses specific value because it both compares and analyses several definitions of green economy and green growth provided by UNEP (2011), OECD (2011) etc. Some authors analysed the relationship between a *green economy*, *green growth* and *sustainable development*.

Kazstelan (2017) concluded that the co-existence of the trio "green economy – green growth – sustainable development" is reasonable due to the complementary and synergistic nature of correlations between these concepts. The author argues that the restructuring of the economy aiming at the so-called "green" solutions (green economy), based on the assumptions of the strategy of green growth, is the primary condition for entering the path of sustainable development. In the economic dimension, green economy and green growth have to enable the overall increase in welfare; in the social aspect, it will translate into improvement in life quality, while in the environmental dimension, they will contribute to reducing pressure on the environment and improving the effectiveness of how natural capital is utilised (Kazstelan, 2017). The primary assumption of a green economy or green growth is not replacing the concept of sustainable development. Still, the conviction that is achieving sustainable development should be based on an adequately oriented economy. Building a green economy based on the assumptions of the strategy of green growth must become an integral element of economic policy on the way towards sustainable development. Finally, Kazstelan (2017) proposes the following definition of green growth: economic growth which contributes to rational utilisation of natural capital, prevents and reduces pollution, and creates chances to improve the overall social welfare by building a green economy, and finally makes it possible to enter on the path towards sustainable development. Such treatment makes it possible for the author to emphasise the integrity of the trio: green growth – green economy – sustainable development. Taking the abovementioned findings into account, the definition of the green economy (to put it in the context of sustainable development) should be enlarged: the green economy is based on sustainable development principles and lays the basis for SD.

These are education (new or modified processes, assimilation etc.), economy (products, goods, services, corporate management, business method, energy use etc.), politics (organisational structures, energy security, just system etc.) and environment (reduction of environmental risk, pollution; pollution-prevention, waste recycling, biodiversity etc.). These findings point to the five-spheres model, the Quintuple Helix.

"Quintuple Helix" model of sustainable development is based on the quality management of development, restoring balance with nature and preserving Earth's biological diversity. Moreover, it can solve existing problems by applying knowledge and know-how, as it focuses on the social (public) exchange and transfer of knowledge within the subsystems of a particular or national state (Barth, 2011; Arsova et al., 2021). The innovative Quintuple Helix Model explains how knowledge, innovations, and the environment (natural environment) are interrelated (Carayannis and Campbell, 2010; Barth, 2011;

Carayannis et al., 2021; Cai, 2022). The Quintuple Helix model is both interdisciplinary and transdisciplinary: the complexity of the five-spiral framework implies that a complete analytical understanding of all spirals requires the continuous involvement of the entire disciplinary spectrum, ranging from Natural Sciences (due to the presence of natural environment factors) to Social Sciences and Humanities, to promote and visualise the system of collaboration between knowledge, know-how and innovations for more sustainable development (Carayannis et al., 2010; Kholiavko et al., 2021). The first subsystem of the Quintuple Helix is the education system, where the necessary human capital is formed. The second subsystem – the economic one – concentrates on the economic capital (e.g., entrepreneurship, machines, food, technologies and money). The third subsystem – the political one, i.e., the political and legal capital (e.g., ideas, laws, plans, policies, etc.). The fourth subsystem unites two forms of capital – social capital and information capital. The fifth subsystem – the environment – is crucial for sustainable development, as it provides people with natural capital (e.g., resources, plants, animal diversity, etc.).

To combine all the findings of the present chapter, it is necessary to work out a definition of green economy that would fit both into the context of the Quintuple Helix Model and sustainable development. In line with such requirements, the study's authors propose that *a green economy* should be defined in the following way: the green economy is an economic system based on sustainable development principles, laying the basis for sd. it ensures economic growth while being compatible with the natural environment and environmentally friendly. It is for many groups and socially comprehend the implementation of specific policy instruments targeted at the environment and disseminate their ideas through the education system.

The Green Growth Index comprises 25 to 30 indicators that characterise four main groups: environmental and resource efficiency of the economy (carbon and energy efficiency, resource efficiency: materials, nutrients, water, multifactor productivity), natural asset base (renewable resources: water, forests, fisheries resources, non-renewable stocks: minerals, biodiversity and ecosystems), the environmental aspects of quality of life (environmental conditions and risks, ecosystem services and environmental benefits), and the economic opportunities and policy instruments that determine green growth (technology and innovation, environmental goods and services, international financial flows, prices and transfers, skills and training, regulations and management approaches). In addition, indicators reflecting the socio-economic context and characteristics of growth (economic growth and economic structure, productivity and trade, labour markets, education and income, as well as socio-demographic characteristics) have been identified. The proposed set of indicators is still being determined. Each country can adapt the set to national circumstances (OECD, 2014).

Measuring progress towards a Green Economy 2012 Indicators at different stages of green economy policies consists of 3 indicators: indicators for environmental issues and targets (Initial stages), indicators for policy interventions (Intermediary Stages), indicators for policy impacts on well-being and equity (Final stages) (United Nations Environment Programme, 2012).

Table 1 presents the main areas and associated indicators for environmental issues and targets.

Table 1. The first stage indicator

Issues	Indicators
climate change	carbon emissions (ton/year), renewable energy (share of power supply) (%), energy consumption per capita (Btu/person)
ecosystem management	forestland (ha), water stress (%), land and marine conservation area (ha)
resource efficiency	energy productivity (Btu/USD), material productivity (ton/USD), water productivity (m3/USD), CO2 productivity (ton/USD),
chemicals and waste management	waste collection (%), waste recycling and reuse (%), waste generation (ton/year) or landfill area (ha)

Source: United Nations Environment Programme, 2012, p.15

Table 2 presents the main areas and their indicators for policy interventions.

Table 2. The second stage indicator

Issues	Indicators
green investment	R&D investment (% of GDP), EGSS investment (USD/year)
green fiscal reform fossil fuel taxation	fossil fuel, water and fishery subsidies (USD or %), fossil fuel taxation (USD or %), renewable energy incentive (USD or %)
pricing externalities and valuing ecosystem service	carbon price (USD/ton), value of ecosystem services (e.g., water provision)
green procurement	expenditure in sustainable procurement (USD/year and %), CO2 and material productivity of government operations (ton/USD)
green job skill training	training expenditure (USD/year and % of GDP), number of people trained (person/year)

Source: United Nations Environment Programme, 2012, p.17

Economic indicators characterising a significant part of the Stage 3 indicator are crucial in the Green Economy approach. Investing in green activities will lead to capital accumulation and job creation while stimulating economic growth through more sustainable production and consumption.

Table 3. The third stage indicator

Issues	Indicators
employment	construction (person, %), operation and management (person, %), income generated (USD/year), Gini coefficient
EGSS performance	value added (USD/year), employment (jobs), CO2 and material productivity (e.g., USD/ton)
total wealth	value of natural resource stocks (USD), net annual value addition/removal (USD/year), literacy rate (%)
access to resources	access to modern energy (%), access to water (%), access to sanitation (%), access to health care (%)
health	level of harmful chemicals in drinking water (g/litre), number of people hospitalised due to air pollution (person), road traffic fatalities per 100 000 inhabitants (transport-related)

Source: United Nations Environment Programme, 2012, p.20

Considering the structure of other indicators found in the literature is interesting. The types of systems for these indicators are illustrated below, using specific indicators as examples.

The construction of the **Green Economy Index by Bożena Ryszawska** (Ryszawska, 2015, 2017) began with an overview of the definitions of a green economy presented in selected strategic documents. The measurement of a green economy covers the assessment of the environmental condition, the pressure exerted on the environment by human activity, and the policies pursued by governments which support actions in favour of a green economy (Ryszawska, 2015, p.45).

Table 4. Areas and indicators for the synthetic Green Economy Index

Area	Indikator
I. Ecosystems/biodiversity / natural capital	
Changes within forests and other woodlands	1
Common birds occurrence	2
II. Emissions, pollution, waste	
Greenhouse gases emissions per capita	3
Amount of hazardous waste generated per capita	4
Sulphur oxides (SOx) per capita 5	5
III. Consumption of resources	
Primary energy use per capita	6
Resource productivity	7
IV. Poverty and social inequalities	
People at risk of poverty or social exclusion	8
Gini coefficient of equivalent disposable income	9
Subjective well-being	10
V. Economy	
Unemployment rate	11
Gross Domestic Product	12
Competitiveness	13
VI. Environmental policy and strategies	
Share of environmental taxes in total tax income	14
Green public procurement	15
Public expenditure on environmental research and development	16
The surface of protected areas	17
VII. Green economy sectors	
Ecological/sustainable agriculture	18
Renewable energy production	19
Recycling	20
Green patents per capita	21

Source: Ryszawska, 2015, p.45

The Global Green Economy Index (Global Green Economy Index, 2014) includes subcomponents: Environment and natural capital, Market and investment; Efficiency sectors, Leadership and climate change. Thirty-two underlying indicators and datasets define the performance index of the 2014 GGEI. Table 5 presents a general structure of these four main dimensions and their associated subcomponents (Global Green Economy Index, 2014, p.8).

Table 5. The performance index of the 2014 GGEI

Dimension	Indicators	Weighting
Leadership & Climate Change	Head of State	20%
	Media Coverage	10%
	International Forums	20%
	Climate Change Performance	50%
Efficiency Sectors	Buildings	25%
	Energy	25%
	Tourism	25%
	Transport	25%
Markets & Investment	Renewable, Energy, Investment, Attractiveness	25%
	Cleantech Innovation	30%
	Cleantech Commercialisation	20%
	Green Investment Facilitation	25%
Environment & Natural Capital	Agriculture	17%
	Air Quality	17%
	Water	17%
	Biodiversity & Habitat	17%
	Fisheries	17%
	Forests	17%

Source: Global Green Economy Index, 2014, p.26

The Green GDP Index (Stjepanović et al., 2019) considers three methodological approaches to calculating environmentally adjusted domestic product: 1) includes consideration of reduction of natural capital; 2) takes into account the degradation of the environment due to the accumulation of pollutants and waste, since they affect both economic activity and natural capital; 3) implies a further deduction of the costs of combating environmental degradation, as these adjusted accounts should show defence costs depending on their impact on natural capital. Stjepanović, Tomić and Škare (2019) proposed an alternative approach to sustainability and green growth, which represents a crucial step towards transforming global economic thinking by ensuring applicable methodology and correct information for the assessment of economic progress. "By following their work and keeping common Green GDP accounting framework (a quantitative position), we have applied a general methodological algorithm that is suitable for the assessment of and comparison between different countries, as well as other surveys" (Stjepanović et al., 2019, p.6).

The Environmental Performance Index in 2020 evaluates only Environmental Health (40%) and Ecosystem Vitality (60%) (Wendling et al., 2020). The 2020 EPI framework organises 32 indicators into 11 issue categories and two policy objectives, with weights shown at each level as a percentage of the total score (Wendling et al., 2020). The 2022 EPI framework organises 40 indicators into 11 issue categories and three policy objectives, with weights shown at each level as a percentage of the total score. The Environmental Performance Index in 2022 evaluates Environmental Health (20%), Climate change (38%) and Ecosystem Vitality (42%) (The Environmental Performance Index, 2022).
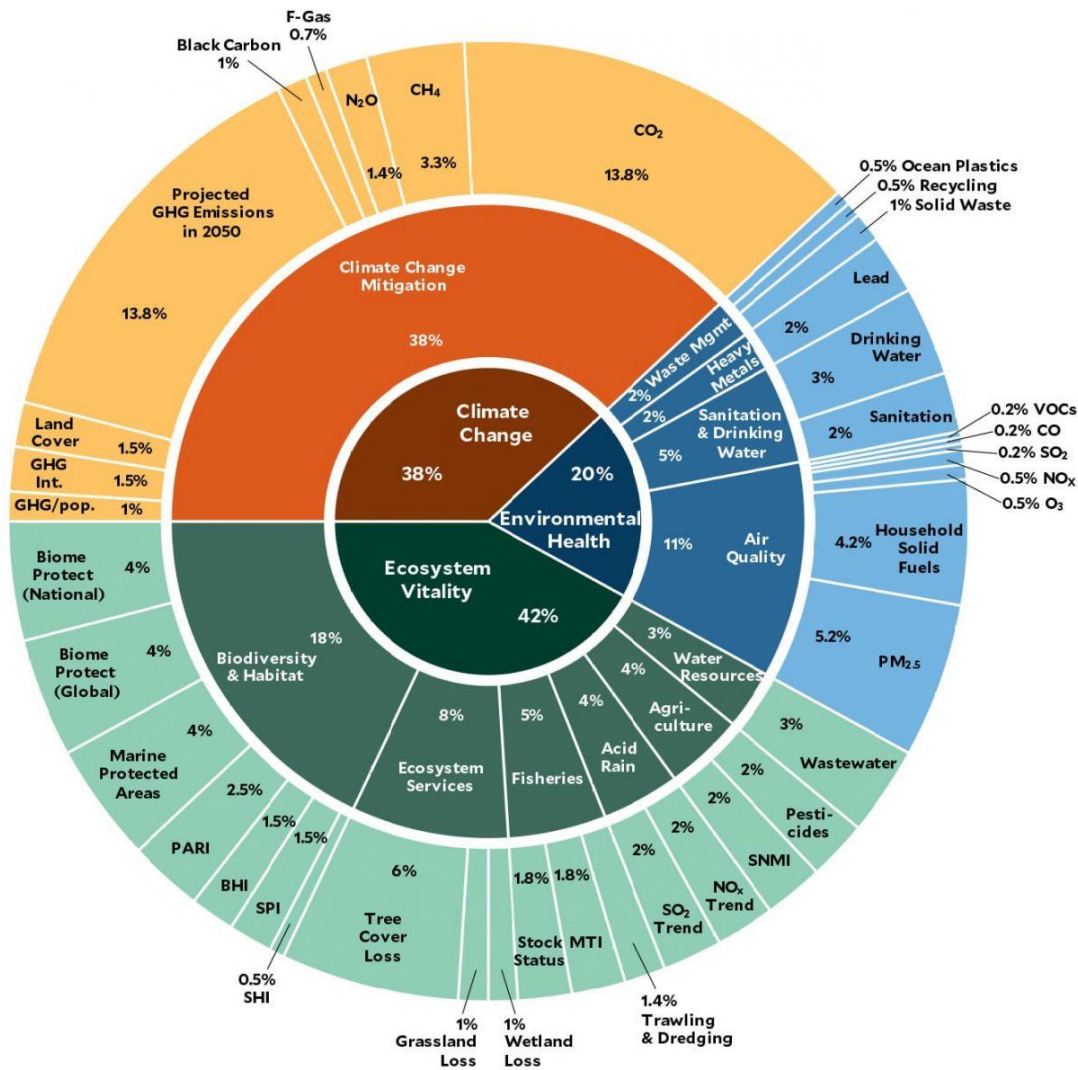
Figure 1. The Environmental Performance Index 2022
Source: The 2022 Environmental Performance Index (EPI)

Other authors also believe that the green economy represents a catalyser for sustainable development in its three dimensions -economic, social and environmental- aiming to improve human well-being and social equity and reduce ecological risks (Chaaben et al., 2022).

The Greenness of Stimulus Index 2021 (Greenness of Stimulus Index, 2021, p.20) is constructed by combining the flow of stimulus into five key sectors with an indicator of each sector's environmental impact, the latter accounting for both historical trends and specific measures taken under the country's stimulus. The five sectors are chosen for their historical impact on climate and environment: agriculture, energy, industry, waste and transport.

Table 6. The Greenness of Stimulus Index 2021. Summary of positive policy archetypes

Sector	Archetype
Agriculture	Bailouts with green strings attached Nature-based solutions Loan and grants for green investments Conservation and wildlife protection programmes
Energy	Bailouts with green strings attached Loan and grants for green investments Green R&D subsidies Subsidies or tax reductions for green products
Industry	Bailouts with green strings attached Loan and grants for green investments Green R&D subsidies Subsidies or tax reductions for green products
Transport	Bailouts with green strings attached Loan and grants for green investments Green R&D subsidies Subsidies or tax reductions for green products
Waste	Bailouts with green strings attached Loan and grants for green investments Green R&D subsidies Subsidies or tax reductions for green products

Source: Greenness of Stimulus Index, 2021, p.21-22

The overall GSI is an indicator of the total fiscal spending in response to COVID-19, categorised as either a positive or negative environmental impact. The final index for each country is an average of sectoral impact, normalised to a scale of -1 to 1 (Greenness of Stimulus Index, 2021, p.20).

Table 7. The Greenness of Stimulus Index 2021. Summary of negative policy archetypes

Sector	Archetype
Agriculture	Subsidies or waived fees for environmentally harmful activities Deregulation of environmental standards Environmentally related bailout without green strings Subsidies or tax reductions for environmentally harmful products
Energy	Subsidies or waived fees for environmentally harmful activities Environmentally harmful infrastructure investments Deregulation of environmental standards Environmentally related bailout without green strings Subsidies or tax reductions for environmentally harmful products
Industry	Subsidies or waived fees for environmentally harmful activities Environmentally harmful infrastructure investments Deregulation of environmental standards
Transport	Subsidies or waived fees for environmentally harmful activities Environmentally harmful infrastructure investments Deregulation of environmental standards Environmentally related bailout without green strings Subsidies or tax reductions for environmentally harmful products
Waste	Subsidies or waived fees for environmentally harmful activities Environmentally harmful infrastructure investments Deregulation of environmental standards Environmentally related bailout without green strings

Source: Greenness of Stimulus Index, 2021, p.23-24

The Greenness of Stimulus Index 2021 (Greenness of Stimulus Index, 2021) covers the areas of "Natural environment", "Educational subsystem", "Economic subsystem", and "Political subsystem". However, it does not consider a social aspect at all. "Natural environment subsystem" may include Nature-Based Solutions, Conservation and wildlife protection programmes, Subsidies for

environmentally harmful activities, Environmentally harmful infrastructure investments, and Environmentally related bailouts without green strings; "Educational subsystem" may include Green R&D subsidies; the "Economic subsystem" - Subsidies or tax reductions for environmentally harmful products, Green infrastructure investments, Subsidies or tax reductions for green products; "Political subsystem" - Deregulation of environmental standards.

The EEPSE Green Economy Index is consistent with the "Quintuple Helix" model of sustainable development (Rybalkin, 2022). "Natural environment subsystem" may include the state of natural environment and resources: forest cover change, water and air pollution etc. (10 indicators); "Educational subsystem" - Level of "green" (ecological) education and R&D (10 indicators); "Economic subsystem" - share of renewable sources of energy, CO2 emissions per capita etc. (10 indicators); "Political subsystem" - political stimulus for green economy development, global climate change partnership (10 indicators); "Societal subsystem" - social and gender inequality, society's involvement into the green economy matters (10 indicators) (Annex 1).
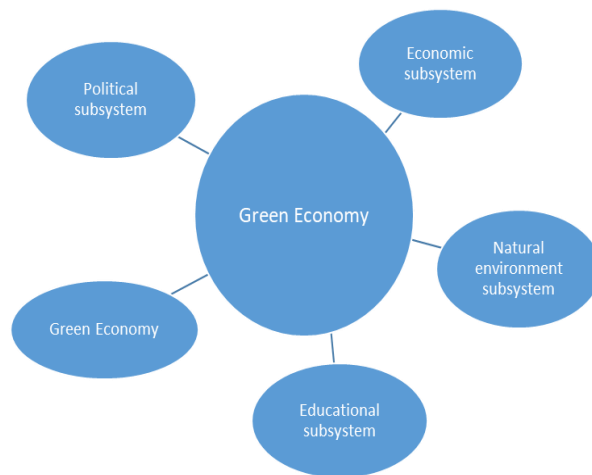

Figure 2. Structure of the EEPSE Green Economy Index
Source: authors

The role of an educational factor in the green economy has long been acknowledged. As early as in Brundtland Report (Brundtland, 1987) there was an appeal, among other things, to educational institutions and the scientific community, which had played indispensable roles in creating public awareness and political change in the past. It was suggested that they would play a crucial part in putting the world onto sustainable development paths. It is also essential that knowledge has been widely recommended as a critical resource to support innovativeness and hence green economy research (Leal-Millán et al., 2017). Indeed, the knowledge base after effective supply chain networking becomes vital for enhancing the green economy (Ibid).

Education can supply the job market with new specialists for the green economy and retrain some existing specialists. As the 'green' spheres in the job market develop, the demand for specialists in new professions known as 'the green collars' grows, too. Specialists in the rapidly evolving energy efficiency policy and savings could be an example of such 'green collars' (Arnett et al., 2009). The role of the economic subsystem can hardly be overestimated due to the importance of the business environment and activities taken by companies, which have to play their proactive role in averting the global climate crisis. Green development has become a strategic issue for firms seeking to achieve environmental improvement and profitability while actively replying to growing environmental pressures and demands.

Still, being concerned about the potential loss of assets due to environmental damage, major asset owners are starting to stimulate the companies in their portfolios to address climate change. This trend is

economically justified since the long-term returns of the world's largest investors are threatened by climate change. The same tendency is observed in the European Union itself, which is the object of the present research. At the beginning of 2020, sustainable European funds held €668 bn of assets, up 58% from 2018. Helping to propel the growth is an increase in new products, with 360 sustainable funds launched in the year, bringing the total number across Europe to 2405. Some 50 sustainable funds established in 2019 had a specific climate-oriented mandate (Black, 2020).

As the clean-energy industry, which can be seen at the core of the economic subsystem described above, is gaining momentum, governments and public bodies are waking up to climate change. Politicians worldwide, particularly in Europe, square up to ecological challenges backing green-infrastructure plans. As early as in the Brundtland Report it has been highlighted that sustainable development is not a fixed state of harmony but rather a process of change in which the exploitation of resources, the direction of investments, the orientation of technological development, and institutional change are made consistent with future as well as present needs. […] Painful choices must be made (Brundtland, 1987). Thus, sustainable development must rest on political will, prior approval procedures for investment and technology choice, foreign trade incentives and all components of development policy.

The role of politics and the state in promoting a green economy is underlined by the fact that the transition towards sustainable development needs to be publicly funded, at least partially, because of the weak competitiveness of clean technologies (at present) compared to the conventional alternatives and the uncertain effectiveness of regulation and other public policies mechanisms (Cecere et al., 2020). As mentioned in Brundtland Report, sustainable development requires changes in values and attitudes towards environment and development – indeed, towards society and work at home, on farms and in factories (Brundtland, 1987).

Such ideas were inherited by the Global Compact – an international initiative launched in July 2000 by United Nations Secretary-General Annan, bringing companies together with UN agencies, labour and civil society to support ten principles of sustainable development (United Nations, 2006). These standards address respect for human rights as set out in the major international instruments, avoidance of complicity in human rights abuses, freedom of employees to associate and engage in collective bargaining, elimination of forced labour and child labour, non-discrimination, a precautionary approach to environmental harm; promotion of environmental responsibility, developing and spreading of environmentally sound technology, avoidance of corrupt practices (United Nations, 2022). Thus, forming environmentally responsible behaviour models for the population and business is essential. This will reduce both unsustainable production and negative environmental impacts—the rest results from the inhabitants' social and ecological activity (Vertakova et al., 2017).

Last but not least subsystem of the new index should be the natural environment. Several factors underline its importance. Paragraph 53 of the Brundtland Report points out that species diversity is necessary for the normal functioning of ecosystems and the biosphere. The genetic material in wild species contributes billions of dollars yearly to the world economy in the form of improved crop species, new drugs and medicines, and raw materials for industry. But utility aside, there are also moral, ethical, cultural, aesthetic, and purely scientific reasons for conserving wild beings. Paragraph 54 states that the priority is establishing the problem of disappearing species and threatened ecosystems on political agendas as a significant economic and resource issue. Sustainable development requires views of human needs and well-being that incorporate such non-economic variables as education and health enjoyed for their own sake, clean air/water and the protection of natural beauty.

Even though all the models mentioned above contribute to the progress towards sustainable development, many indices still need to reflect all the components of SD: societal, economic, political, educational and environmental. Even though particular indices (such as OECD indicator, Greenness of Stimulus Index (Vivid Economics, 2021) and Green Economy Index by Ryszawska (2015) seem to be the most comprehensive and inclusive, they still miss certain aspects of sustainable development:

societal in first two cases and educational in the third. Against this background, it can be concluded that the integrated indicator EEPSE Green Economy Index most accurately characterises green economy in the context of sustainable development, its principles and components.

3. Conclusions

The content of the categories "green economy", "green technologies", "eco-innovation", "green innovation", "and green growth" confirm the growing interest in the green economy, suggesting potential directions of development towards the establishment of a consistent set of indicators, since the critical problem at this point lies in the lack of their homogeneity. Each organisation employs their own set of indicators, frequently based on quite divergent definitions.

The analysis of scientific literature within the present research allowed us to identify the characteristic features of the green economy and its relationship with the concept of sustainable development. In line with that, the authors' interpretation of the concept of "green economy" was given: the green economy is an economic system based on sustainable development principles, laying the basis for SD. It ensures economic growth while being compatible with the natural environment and environmentally friendly. It is for many groups and socially comprehend the implementation of specific policy instruments targeted at the environment and disseminates their ideas through the education system. Moreover, different models and indices dealing with the green economy were analysed through the prism of the newly developed definition.

Discussions about the green economy usually take place in the context of the concept of sustainable development. There is a perception in the information space that these concepts are identical; many articles in this field of knowledge make this point explicitly and implicitly. However, it would be a mistake to consider them synonyms.

As a tool for sustainable development, the green economy indices reflect certain aspects of sustainable development that are most important, according to the authors of the indices. Thus, the structure of these indices varies and depends on the concept of sustainable development adopted by the authors. Some indices reflect only the area of the natural environment, others the economic area or the economic, social and political areas, etc. Consequently, the structure of the indices depends on the authors' approach to sustainable development.

References:

Alcalde-Calonge, A., Sáez-Martínez, F.J., & Ruiz-Palomino, P. (2022). Evolution of research on circular economy and related trends and topics. A thirteen-year review. *Ecological Informatics*, *70*, 101716. https://doi.org/10.1016/j.ecoinf.2022.101716

Alsmadi, A.A., & Alzoubi, M. (2022). Green Economy: Bibliometric Analysis Approach. International *Journal of Energy Economics and Policy, 12*(2), 282-289. https://doi.org/10.32479/ijeep.12758

Andersén, J. (2021). A relational natural-resource-based view on product innovation: The influence of green product innovation and green suppliers on differentiation advantage in small manufacturing firms. *Technovation*, *104*, 102254. https://doi.org/10.1016/j.technovation.2021.102254

Arnett, S.E., Kozlowski, P., Peach, P., & Várela, E. (2009) Career and technical education: for the new green collar workforce. *Techniques: Connecting Education and Careers*, *84*, 36-39. Retrieved from: https://files.eric.ed.gov/fulltext/EJ858229.pdf

Arsova, S., Genovese, A., Ketikidis, P.H., Alberich, J.P., & Solomon, A. (2021). Implementing Regional Circular Economy Policies: A Proposed Living Constellation of Stakeholders. *Sustainability*, *13*(9), 4916. https://doi.org/10.3390/su13094916

Barth, T.D. (2011). The Idea of a Green New Deal in a Quintuple Helix Model of Knowledge, Know-How and Innovation. *International Journal of Social Ecology and Sustainable Development*, *2*(1), 1-14. https://doi.org/10.4018/jsesd.2011010101

Bergius, M., Benjaminsen, T.A., Maganga, F., Buhaug, H. (2020). Greeneconomy, degradation narratives, and land-use conflicts in Tanzania. *World Develop*, *129*, 104850. https://doi.org/10.1016/j.worlddev.2019.104850

Black, H. (2020) Record-shattering year for sustainable investments. Morningstar. Retrieved from: https://www.morningstar.co.uk/uk/news/199190/record-shattering-year-for-sustainable-investments.aspx

Bogovic, N.D., & Grdic, Z.S. (2020). Transitioning to a green economy possible effects on the Croatian economy. *Sustainability*, *12*, 9342. https://doi.org/10.3390/su12229342

Brundtland, G. (1987) Report of the World Commission on Environment and Development: Our Common Future. United Nations General Assembly document A/42/427. Retrieved from: https://sustainabledevelopment.un.org/content/documents/5987our-common-future.pdf

Cai, Y. (2022). The Tribology of the Helixes: Relations between Triple, Quadruple and Quintuple Helix Models. *Triple Helix*, *9*(1), 1-5. https://doi.org/10.1163/21971927-12340006

Carayannis, E. G., & Campbell, D. F. (2010). Triple Helix, Quadruple Helix and Quintuple Helix and How Do Knowledge, Innovation and the Environment Relate To Each Other? *International Journal of Social Ecology and Sustainable Development*, *1*(1), 41-69. https://doi.org/10.4018/jsesd.2010010105

Carayannis, E.G., Campbell, D.F.J., & Grigoroudis, E. (2021). Helix Trilogy: the Triple, Quadruple, and Quintuple Innovation Helices from a Theory, Policy, and Practice Set of Perspectives. *Journal of the Knowledge Economy*, 13(3), 2272-2301. https://doi.org/10.1007/s13132-021-00813-x

Cecere, G., Corrocher, N., & Mancusi, M. L. (2020). Financial constraints and public funding of eco-innovation: empirical evidence from European SMEs. *Small Business Economics*, 54(1), 285-302. https://doi.org/10.1007/s11187-018-0090-9

Chaaben, N., Elleuch, Z., Hamdi, B. et al. (2022). Green economy performance and sustainable development achievement: empirical evidence from Saudi Arabia. *Environ Dev Sustain* https://doi.org/10.1007/s10668-022-02722-8

Chavula, P., & Turyasingura B. (2022). Critical thinking on Green Economy for SustainableDevelopment in Africa. *International Journal of Academic and Applied Research (IJAAR)*, *6*(8), 181-188 https://www.researchgate.net/publication/363137435_Critical_thinking_on_Green_Economy_for_Sustainable_Development_in_Africa

Chen, Y.S., Lai, S.B., & Wen, C.T. (2006). The Influence of Green Innovation Performance on Corporate Advantage in Taiwan. *Journal of Business Ethics*, *67*(4), 331-339. https://doi.org/10.1007/s10551-006-9025-5

European Commission. (2022). Sustainable Development Goals. Retrieved August 24, 2022 from: https://ec.europa.eu/international-partnerships/sustainable-development-goals_en

European Environment Agency. (2022). *Evaluation of progress under the EU National Emission Ceilings Directive - Progress towards EU air quality objectives, EEA Technical Report No 14/2012*. Retrieved February 5, 2022, from https://www.eea.europa.eu/data-and-maps/indicators/main-anthropogenic-air-pollutant-emissions/eea-2012

Fulai, S. (2010). Green Economy: conceptual issues. *Background Paper for the UNEP Major Groups and Stakeholders Consultation on Green Economy*, 1-7. http://new.unep.org/civilsociety/Portals/59/Documents/GMGSF12-GE-Conceptual-Issues.pdf

Global Green Economy Index 2014. (2014). *GGEI Measuring National Performance in the Green Economy. 4th edition. 49 p.* Retrieved February 2, 2022 from https://sustainabledevelopment.un.org/content/documents/1678GGEI-Report2014.pdf

Green Growth Index 2020. (2021). GGGI Technical Report *No. 16*. Measuring performance in achieving SDG targets. December 2020. Retrieved January 28, 2022 from https://greengrowthindex.gggi.org/wp-content/uploads/2021/01/2020-Green-Growth-Index.pdf

Greenness of Stimulus Index 2021. Retrieved September 7, 2022 from: https://www.naturefinance.net/wp-content/uploads/2022/09/Green-Stimulus-Index-6th-Edition_final-report.pdf

Greening the economy: mainstreaming the environment into economic development. ECE/ASTANA.CONF/2011/4. Economic and Social Council Distr. Astana, Kazakhstan 21–23 September 2011. https://unece.org/DAM/env/greeneconomy/GreenEconomy_1page_July_2016/ece.astana.conf.2011.4.e.pdf

Inclusive Green Growth. (2012). Washington: World Bank. 192 p. https://doi.org/10.1596/978-0-8213-9551-6

Kasztelan, A. (2017). Green Growth, Green Economy and Sustainable Development: Terminological and Relational Discourse. *Prague Economic Papers*, *26*(4), 487-499. https://doi.org/10.18267/j.pep.626

Kasztelan, A. (2021). On the road to a green economy: how do European Union countries 'do their homework'? *Energies*, *14*, 5941. https://doi.org/10.3390/en14185941

Kemp, R., & Pearson, P. (2007). *Final Report MEI Project about Measuring Eco-innovation*. UM Merit. Retrieved September 21, 2022 from: https://www.oecd.org/env/consumption-innovation/43960830.pdf

Khan, J., Johansson, B., & Hildingsson, R. (2021). Strategies for greening the economy in three Nordic countries. *Environmental Policy and Governance*, *31*(6), 592-604. https://doi.org/10.1002/eet.1967

Kholiavko, N., Grosu, V., Safonov, Y., Zhavoronok, A., & Cosmulese, C. G. (2021). Quintuple Helix Model: Investment Aspects of Higher Education Impact on Sustainability. *Management Theory and Studies for Rural Business and Infrastructure Development*, *43*(1), 111-128. https://doi.org/10.15544/mts.2021.10

Leal-Millán, A., Leal-Rodríguez, A.L., & Albort-Morant, G. (2017) Green innovation. Encyclopedia of Creativity, Invention, Innovation and Entrepreneurship. Key Concepts and Definition of Terms New York, NY: Springer. Retrieved from: https://doi.org/10.1007/978-1-4614-6616-1_200021-1

Medvedkina, Y., & Khodochenko, A. (2020). Sustainable Development of the BSEC Member States for the Effective Integration into Green Economy. KS Soliman (Ed.), Education Excellence and Innovation Management: A 2025 Vision to Sustain Economic Development during Global Challenges, 18280-18294. Seville, SPAIN, Int Business Informat Management Assoc. https://www.webofscience.com/wos/woscc/full-record/WOS:000661489809030

Nuryakin, N., & Maryati, T. (2022). Do green innovation and green competitive advantage mediate the effect of green marketing orientation on SMEs' green marketing performance? *Cogent Business & Amp; Management*, *9*, 2065948 https://doi.org/10.1080/23311975.2022.20659

OECD (2011). *Towards Green Growth: Monitoring Progress*. OECD Indicators. OECD Publishing. https://doi.org/10.1787/g2210af2d-en

OECD (2014). The OECD green growth measurement framework and indicators", in Green Growth Indicators 2014, OECD Publishing. http://dx.doi.org/10.1787/9789264202030-4-en

OECD (2017). *Green growth indicators 2017*. OECD Green Growth Studies. OECD Publishing, Paris. https://doi.org/10.1787/9789264268586-en

Oliinyk, N. (2020). Conceptual Foundations of "Green" Economy in the Context of Sustainable Development. *Social Economics*, 60. https://doi.org/10.26565/2524-2547-2020-60-02

Oltra, V., & Saint Jean, M. (2009). Sectoral systems of environmental innovation: An application to the French automotive industry. *Technological Forecasting and Social Change*, *76*(4), 567-583. https://doi.org/10.1016/j.techfore.2008.03.025

Rybalkin, O. (2022) Sustainable development goals progress in the European Union: correlation with EEPSE Green Economy Index. *Access to Science, Business, Innovation in Digital Economy, ACCESS Press, 3*(2), 121-135. https://doi.org/10.46656/access.2022.3.2(3)

Ryszawska, B. (2013). Green Economy – Theoretical Foundations of the Concept and Measurement of Its Implementation in the European Union. Wrocław: Publishing house of the University of Economics

Ryszawska, B. (2015). Green Economy Indicators. In: *Towards a Green Economy. From Ideas to Practice*. M. Burchard-Dziubińska (ed.). Wydawnictwo Uniwersytetu Łódzkiego, Łódź, 31-52. Retrieved February 8, 2022 from https://www.researchgate.net/publication/292147307_Green_Economy_Indicators

Ryszawska, B. (2017). Green Economy transition and regional policy of European Union. *Prikladna ekonomika- vid teori i do praktiki.* [Applied economics - a kind of theory and practice]. 13-16. http://dspace.wunu.edu.ua/bitstream/316497/24349/1/RYSZAWSKA%20B..pdf

Sobczak, E., Głuszczuk, D., & Raszkowski, A. (2022). Eco-Innovation and Innovation Level of the Economy as a Basis for the Typology of the EU Countries. *Environ Res Public Health*, *19*(4). doi.org/10.3390/ijerph19042005

Söderholm, P. (2020). The green economy transition: the challenges of technological change for sustainability. *Sustain Earth*, *3*, 6 https://doi.org/10.1186/s42055-020-00029-y

Stjepanović, S., Tomić, D., Škare, M. (2019). Green GDP: An Analysis for Developing and Developed Countries. *Economics,* XXII, 4. https://doi.org/10.15240/tul/001/2019-4-001

Swart, J., & Groot, L. (2020). Sustainable development: The transition to the green economy. *Quality - Access to Success*, *15*(1), 129-133.

The Environmental Performance Index, (2022). Retrieved March 9, 2022, https://epi.yale.edu/

Trushkina, N. (2022). Green economy in the conditions of modern challenges: conceptual frameworks. *International Science Journal of Management, Economics & Finance*, *1*(1), 1-6. https://doi.org/10.46299/j.isjmef.20220101.1

UNEP. (2011). *Towards a Green Economy: Pathways to Sustainable Development and Poverty Eradication.* Retrieved February 21, 2022, from https://sustainabledevelopment.un.org/content/documents/126GER_synthesis_en.pdf

United Nations Environment Programme (2012). Measuring Progress towards a Green Economy. Retrieved March 11, 2022, from https://www.greengrowthknowledge.org/sites/default/files/downloads/resource/Measuring_progress_towards_an_inclusive_GE_UNEP.pdf

United Nations. (2006) Secretary-General Launches 'Principles for Responsible Investment' Backed by World's Largest Investors. Press release. SG/2111-ECO/106, 27 April. Retrieved May 1, 2022 from: https://press.un.org/en/2006/sg2111.doc.htm

United Nations. (2011). *Economic and Social Survey of Asia and the Pacific 2011: Sustaining Dynamism for Inclusive Development - Connectivity in the Region and Productive Capacity in Least Developed Countries* (2011 ed.).

United Nations. (2022) The Ten Principles of the UN Global Compact. Retrieved March 2, 2022, from: https://www.unglobalcompact.org/what-is-gc/mission/principles/principle-2 .

Vertakova, Y., Plotnikov, V. (2017). Problems of sustainable development worldwide and public policies for green economy. *Economic Annals-XXI*, *166*(7-8), 4-10. https://doi.org/10.21003/ea.V166-01

Vivid Economics. (2021). Greenness of Stimulus Index 2021. Retrieved February 23, 2022, from https://www.vivideconomics.com/wp-content/uploads/2021/02/Greennes-of-Stimulus-Index-5th-Edition-FINAL-VERSION-09.02.21.pdf

Wendling, Z.A., Emerson, A. de Sherbinin, & Etsy, D.C. (2020). Environmental Performance Index 2020. New Haven, CT: Yale Center for Environmental Law and Policy. https://doi.org/10.13140/RG.2.2.21182.51529

Annex 1
Indicators used for each of the subsystems of the Quintuple Helix

Subsystem 1. Education:
S_1_1 Research institutions prominence 0–100 (best) (Global competitiveness report (further – GCR) 2019);
S_1_2 Scientific publications score (GCR, 2019);
S_1_3 Gross expenditure on R&D, % of GDP (Global Innovation Index, 2020);
S_1_4 Total number of documents in Scopus, Environmental science, cumulative, 1996 – 2019 (SJR — SCImago, 2021);
S_1_5 Citable documents, 1996 – 2019 (SJR — SCImago, 2021);
S_1_6 Citations (SJR — SCImago, 2021);
S_1_7 Self-citations (SJR — SCImago, 2021);
S_1_8 Citations per document (SJR — SCImago, 2021);
S_1_9 h-index, (SJR — SCImago, 2021);
S_1_10 Patents by origin/bn PPP$ GDP (Global Innovation Index Report, 2020);
Subsystem 2. Economic aspects:
S_2_1 GDP per unit of energy use (Global Innovation Index Report, 2020);
S_2_2 ISO 14001 environmental certificates per bn PPP$ GDP (Global Innovation Index Report, 2020);
S_2_3 Resource efficiency index (The global sustainable competitiveness index, 2020);
S_2_4 Greenhouse gas emissions score (Climate Change Performance Index, 2021);
S_2_5 Share of renewable energy in gross final energy consumption by sector, % (Eurostat, 2019)
S_2_6 The global sustainable competitiveness index (2020);
S_2_7 Circular material use rate, % of material input for domestic use (Eurostat, 2019);
S_2_8 Efficiency sectors (Global Competitiveness Report, 2019);
S_2_9 growth of innovative companies 1–7 (best) (Global Competitiveness Report, 2019);
S_2_10 Energy transition index (Energy transition index 2020 by World Economic Forum);
Subsystem 3. Political system:
S_3_1 Stringency of environmental regulations, index (Travel and Tourism Competitiveness Report, 2019);
S_3_2 Enforcement of environmental regulations, index (Travel and Tourism Competitiveness Report, 2019);
S_3_3 Environment-related treaties in force count (out of 29 possible) (Global Competitiveness Report, 2019);
S_3_4 Climate policy, index – covers both national and international climate policy performance (Climate change performance index, 2021);
S_3_5 Climate Change Performance Index (Climate change performance index, 2021);
S_3_6 Environmental performance, index (Global Innovation Index, 2020);
S_3_7 Environmental tax revenues, % of GDP (Eurostat, 2018);
S_3_8 Intellectual property protection 1–7 (best) (Global Competitiveness Report, 2019);
S_3_9 population covered by the Covenant of Mayors for Climate & Energy signatories – percentage of total population (Eurostat, 2019, for the UK – 2018);
S_3_10 Renewable energy regulation 0–100 (best) (Global Competitiveness Report, 2019).
Subsystem 4. Civil society:
S_4_1 Attitude of European citizens towards the environment – percentage of population who consider environmental issues to be important (Eurobarometer, 2017);
S_4_2 World Press Freedom Index (Reporters without borders, 2020)*;
S_4_3 Democracy index (The Economist Intelligence Unit, 2020);
S_4_4 Civil liberties (The Economist Intelligence Unit, 2020);
S_4_5 Social Capital Index (The global sustainable competitiveness index, 2020);

S_4_6 Incidence of corruption 0–100 (best), (Global Competitiveness Report 2019);
S_4_7 Internet users % of adult population, (Global Competitiveness Report, 2019).
S_4_8 People at risk of poverty or social exclusion, Eurostat (2019), except for Ireland, Italy, the UK (2018);
S_4_9 Share of busses and trains in total passenger transport, % of total inland passenger-km (Eurostat, 2018);
S_4_10 Females employed with advanced degrees, % (Global Innovation Index, 2020).
Subsystem 5. Natural environment:
S_5_1 Environmental performance index (Environmental performance index report, 2020);
S_5_2 Air quality (Environmental performance index report, 2020);
S_5_3 Water resources (Environmental performance index report, 2020);
S_5_4 Biodiversity and habitat (Environmental performance index report, 2020);
S_5_5 Forest cover change, % (The Travel & Tourism Competitiveness Report, 2019)*;
S_5_6 Wastewater treatment, % of total (The Travel & Tourism Competitiveness Report, 2019);
S_5_7 Total protected areas, % of territory (The Travel & Tourism Competitiveness Report, 2019);
S_5_8 Natural capital (The Global Sustainable Competitiveness Index, 2020);
S_5_9 Ecological sustainability, index (Global Innovation Index Report, 2020);
S_5_10 Agriculture (Environmental performance index report, 2020);
*   *a negative indicator (inverse relationship with sustainable development).*

Data Availability Statement: All data is provided in full in the results section of this paper.

Author Contributions: Conceptualisation: *O.R., O.L., A.D.*; methodology: *O.R., O.L., A.D.*; data analysis: *O.R., O.L., A.D.*; writing—original draft preparation: *O.R., O.L., A.D.*; writing; review and editing: *O.R., O.L., A.D.*; visualisation: *O.R., O.L., A.D.* All authors have read and agreed to the published version of the manuscript.

Oleg RYBALKIN is PhD candidate in Economics of Daugavpils University. His research interests: regional economics, sustainable development, green economy.
ORCID ID: https://orcid.org/0000-0002-7310-4594

Olga LAVRINENKO is Dr. oec, Leading researcher at the Institute of Humanities and Social Sciences of Daugavpils University, Latvia. She has status of experts of the Latvian Council of Science in the field of economics and entrepreneurship. Her research interests: regional economics, sustainable economic development.
ORCID ID: https://orcid.org/0000-0001-7383-3749

Alina DANILEVIČA is Dr. oec, Researcher at the Institute of Humanities and Social Sciences of Daugavpils University, Latvia. She has the status of Expert of the Latvian Council of Science in the fields of economics and entrepreneurship, sociology and social work. Her research interests: regional economics, investments, investment climate (entrepreneurial environment).
ORCID ID: https://orcid.org/0000-0002-2749-2725

Marija SPRŪDE is a secretary and SIA Apple Press representative in the International Consortium "Cooperation for Carrying out Innovative Activities that Contribute to Ecology for Sustainable Development in Central and Eastern European Regions", Bachelor of English philology
ORCID ID: https://orcid.org/0000-0001-9115-7297

Make your research more visible, join the Twitter account of ENTREPRENEURSHIP AND SUSTAINABILITY ISSUES: @Entrepr69728810