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Green Economy, Trade, and Consumers – Interactions in European Green Transition

Abstract: This article presents a current and significant problem by exploring the main problems of the European Green Transition; the authors discuss these in two aspects: first, the goals of the Green Transition as one of the European Union's strategic priorities – the goals, achievements, and possible risks that face the European Union's green policies are discussed.

The second aspect of the study is the authors' attempt to reveal and comment on the role of trade and consumers as a tool that works in favor of the Green Transition – specifically, those that are included in European Union documents such as the Green Deal and the Circular Economy Action Plan. The definition of the problem is based on the understanding that, on the one hand, trade as an economic sector is developing most dynamically and on a large scale, making Sector G the largest set of enterprises among all of the sectors that carry out economic activities in the EU (including Bulgaria). On the other hand, trade as a business activity is closely linked to consumers; it actively interacts with them and, therefore, has a significant impact on their behaviors (including their impact on the environment). In practice, it is impossible to achieve the green goals without the connection and interaction "trade-consumers"; in addition to being aimed at achieving a modern, resource-efficient, and competitive EU economy, these reflect the Union's aspiration to protect its people's health and increase their collective well-being.

Keywords: green economy, trade, consumers, Green Transition, environment

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1. Introduction

The Green Transition is one of the priority areas that faces the European Union's development; this requires an interdisciplinary approach in order to achieve it. On the one hand, a significant part of the EU's efforts in this direction are related to environmental protection and include activities such as the prevention, limitation, and elimination of environmental pollutants; on the other hand, the EU makes a concerted effort to manage natural resources in order to protect natural reserves from depletion and extinction and help restore and increase them. A green transformation of the economy, consumer behavior, and society as a whole are the ways to achieve these goals. All of the strategies that are related to the Green Deal and other EU action plans (including the Circular Economy Action Plan) play key roles in achieving a modern European economy and the sustainable development of our society. Such actions should ensure decarbonization, reduce (or even eliminate) greenhouse gas emissions from the entire economy, use more renewable energy sources, achieve high energy efficiency, and maximize economic circularity. Trade and consumers play essential roles in this process, as does an active interaction between them.

In light of the above, the article aims to discuss EU green policies and reveal the growing role of trade and consumers that benefit the Green Transition.

2. Literature Review – Green Economy in EU Green Transition

The Green Transition is about a complete transformation of the European economy; it encompasses all actively used resources, all economic activities, and consumer behaviors that significantly impact the environment. This transformation aims to lead to a climate-neutral and resource-efficient economy and a more sustainable and healthier lifestyle for consumers. From this point of view, the Green Transition is a huge challenge and ambition for the European Union to achieve. The green economy plays a key role in the transition process.

In the economic literature, the green economy is seen as a part of the economy that is based on the use of alternative energy sources in order to reduce harmful emissions, achieve energy savings, and help protect the environment. The potential opportunities of the green economy also include saving the world from poverty and making natural resources accessible to all consumers [1].

The United Nations Environment Programme (UNEP) promotes low-carbon, resource-efficient, and socially inclusive economies. An inclusive green economy improves human well-being and builds social equality while reducing environmental risks and ecological scarcities. An inclusive green economy is an alternative to today's dominant economic model, which exacerbates inequalities, encourages waste, triggers resource scarcity, and generates widespread threats to the environment and human health [2]. Therefore, the green economy is becoming a strategic priority for many countries in the current decade (including the development of the EU).

A strategic aspect of the green economy is the concept of circularity, which seeks to reuse waste for industrial production (that is, transforming waste into new production). This interaction between the green economy and waste management determines the concept of zero pollution or the zero waste concept. This concept is directly related to achieving those global targets that are connected to achieving the climate-neutrality objective as well as to the circular economy; it strives for a waste-free life and should, therefore, be perceived as raw materials that can be reused, recycled, or (in extreme cases) recovered for energy purposes [3]. From this point of view, various business models of a circular economy could be effectively used in practice, such as the following [4]:

- product as service,
- follow-up sales,
- product transformation,
- recycling.

The Green Deal (representing a widely discussed pact that could partly be revised and refined according to the opinions of experts in various fields of politics and economics) and the Circular Economy Action Plan are strategic for implementing the European Green Transition (EGT). The main targets of these plans are visualized in Figure 1.

Fig. 1. Key targets in field of Green Transition

Source: authors' research on EGT (https://www.europeangreentransition.com/)

The green targets are subject to different EU policies; these are presented and commented on in Table 1.

Table 1. Policies that are relevant to EGT

Scope of problem	Purposes and achievements as well as possible risks
Climate and its change	Climate issues have been known for decades and are related to the impact of human activity on the atmosphere. The greenhouse effect is a global fact, as is the significant increase in the average global air temperature. In turn, this has led to temperature changes and acidification in the world's oceans, the melting of snow and ice massifs, and climatic phenomena that create serious risks of forest fires, landslides, and floods as well as losses of biodiversity and arable lands. **Purposes** Short-term objective: reduce greenhouse gas emissions by at least 50% by 2030 as compared to 1990 levels. Strategic objective: achieve climate neutrality by 2050 (zero emissions). **Achievements** Energy Taxation Directive – revision of the directive to focus on those problematic issues that are related to environmental protection [5]. EU Emissions Trading System (EU-ETS) – a measure (in the form of a directive) to limit or even cap the carbon emissions that are emitted by all active businesses. The aim of this is to stimulate investment and innovation in cleaner energy sources (such as photovoltaics) [6]. European Climate Law – the law (in the form of regulation) ensures that climate issues are reflected in European legislation so that all sectors contribute to achieving climate neutrality objectives through the functions that they perform [7]. **Risks** Risk of carbon leakage – e.g., the transfer of production from the EU to third-world countries with lower carbon-reduction targets; the replacement of EU products with imported ones (with greater carbon footprints); mismatches among the EU's goals and policies with global climate ambitions [8].
Energy and growing demand for energy	The growing demand for energy causes drastic and very dangerous climate change on the one hand and the insufficient energy efficiency of industry on the other. Generally speaking, this necessitates the use of as many clean and renewable energy sources as possible. **Purposes** Short-term objective: the decarbonization of coal and gas. Strategic objective: the development of an energy sector that is based on clean and renewable sources and their smart integration in all sectors; achieving a comprehensive energy union. **Achievements** The implementation of Trans-European Energy Networks (TEN-E) – to ensure the integrated interconnection of the energy infrastructure of the EU Member States. Currently, the objectives of the Trans-European Energy Networks are financed by the Connecting Europe Facility (2021–2027). The governance of the Energy Union and Climate Action – established by Regulation (EU) 2018/1999, which states as its primary objective to provide European consumers and their households with sustainable and, at the same time, economically affordable energy while also improving the quality of the environment [9]. **Risks** The risk of energy poverty for those households that cannot afford basic energy services and are, therefore, unable to maintain a minimum standard of living.

Table 1. cont.

Industry and circular economy – two sides of transition to cleaner environment	Industry strongly impacts the environment because of the pollution and the large amount of waste that are generated by industrial production. Over the past few decades, the extraction of raw materials has more than tripled worldwide. Nearly half of the total greenhouse gas emissions into the atmosphere and more than 90% of the biodiversity losses (as well as water scarcity) are precisely due to the extractions of resources and the processing of materials and fuels. EU industry is more 'linear' (take-produce-throw economic model) and, therefore, highly dependent on the extractions of raw materials and the polluting of the environment. Of the materials that are used in European industry, only 12% are derived from recycled products; therefore, there is a need to accelerate the introduction of circular models in the use of inputs in production, prioritize the reuse and recycling of waste, and implement a policy for producing "sustainable products." **Purposes** Short-term objective: decarbonization and full modernization of industry and achieving a high level of circularity (75% recycling of packaging waste by 2030; 65% recycling of municipal waste by 2030; 10% landfilling). Strategic objective: to achieve a sustainable model of the inclusive growth of the industrial sectors and the active use of secondary raw materials in production. Integrating modern environmentally and economically sustainable models that allow for the recovery and recycling of municipal waste in order to transform it into energy or raw material for industrial production or into fertilizer for plants by depositing minimal amounts of waste. **Achievements** Circular economy plan – promotes the reuse of goods and materials and their recycling. 2018 Plastics Strategy – envisages that, by 2030, all packaging on the EU market is ready for reuse or recycling; creating a regulatory framework for biodegradable plastics and bio-based plastics; implementing measures for single-use plastics [10]. Policy to produce sustainable products – this is to be aimed at significantly reducing waste (or restoring its economic value) to avoid its impact on the environment and, accordingly, overcome or minimize climate change. In this regard, measures are envisaged against excessive packaging and the creation of a great deal of waste. On the other hand, EU businesses should be offered a sustainable single market for secondary raw materials. Digital technologies for supporting the circular economy (artificial intelligence, and the Internet of Things) have the potential to accelerate and maximize the impact of all climate and environmental policies. **Risks** The risk of some industrial enterprises that cannot afford to modernize their productions of abandoning the ecological transition will inevitably lead to the losses of jobs and businesses, reductions of revenues in state budgets, etc.
Construction and "Renovation Wave"	As a structurally important sector, construction is extremely important for the growth of the economy; at the same time, it has a strong impact on the environment and climate. This determines the growing need for effective and, above all, sustainable solutions – both in terms of the construction, repair, and renovation of public, residential, and business buildings as well as infrastructure projects such as the construction of water supply networks, sewerage and transport networks, and others of national and European importance. **Purposes** Short-term objective: "Renovation Wave" – doubling the renovation of the building stock in the member states. Strategic objective: to achieve a sustainable model that ensures the energy efficiency of the building stock and reduces energy poverty.

Table 1. cont.

Scope of problem	Purposes and achievements as well as possible risks
	Achievements The introduction of a new emissions-trading system for the construction sector with the aim of significantly reducing emissions from this sector (starting in 2026). Directive on the Energy Performance of Buildings (Directive 2010/31/EU) – its primary objective is to achieve a reduction in energy consumption in the building sector and, at the same time, stimulate the use of renewable sources in construction in order to ensure reductions of greenhouse gas emissions into the atmosphere [11]. Regulation on construction products – this is relevant to not only those requirements that are related to the safety of buildings but also environmental protection, energy savings, the durability of buildings, the circular economy, and many other aspects that are in the public interest (Regulation [EU] No. 305/2011) [12]. Europe's "Renovation Wave" strategy aims to create green residential buildings, enhance quality of life, and extend the lifespan of existing structures. This is particularly crucial for buildings constructed with old panel systems. These processes were successfully started in Bulgaria about ten years ago. At the same time, the strategy reflects society's digital progress, contributes to the introduction of innovations in small and medium-sized businesses, and supports the creation of new jobs in the construction sector. **Risks** Difficult access to better financing conditions in the field of green building and the renovations of old buildings.
Environment and challenges that it faces	The environment in which the economy develops and consumers live simultaneously logically poses the most problems in terms of the environment's preservation, recovery, and future development. These issues are related to protecting the air, water, soil, and nature in general as well as to managing waste, climate, noise, and radiation. **Purposes** Short-term objective: the elimination of pollutants of environmental elements (air, soil, water) and the mandatory removal of pollution from consumer products. Strategic objective: high protection of consumer health and environmental protection. **Achievements** As its main objective, the Action Plan Towards Zero Pollution of Air, Water, and Soil concerns the protection of human health and the preservation of natural ecosystems [13]. The developments of planning documents and procedures for assessing the compatibility of investment plans (or investment proposals) with protected natural and urban areas. Preparation of assessments of the impact of investment projects on the state and future development of the environment, etc. Systematic updating and improvement of European legislation in the field of protection and sustainable use and restoration of land, water and air. Harmonization of European legislation with the legislation of the member states. Systematic monitoring of noise (mostly from industrial sources) to control the acoustic environments of settlements.

Table 1. cont.

	Systematic radiological monitoring of the environment to monitor and prevent the risks of gamma radiation as well as the presence of hazardous and harmful substances in the air, soil, and water (including those found in building materials, etc.). **Risks** These are mostly related to unpredictability in the development of various natural phenomena, which are difficult to counteract despite the achievements in the field of environmental protection.
Ecosystems and biodiversity	Economic development and consumer consumption seriously impact ecosystems, intensively altering natural resources and the climate. On the other hand, land, seas, oceans, natural resources, and climate are factors that are essential for the diversity of biological species. Therefore, the permanent and intensive exploitation of natural resources and climate exploitation leads to declining biodiversity. **Purposes** Short-term objective: implementation of an EU nature-restoration plan. Strategic objective: all ecosystems to be restored, protected, and used sustainably. **Achievements** The EU as a party to the UN Convention on Biological Balance – the EU contributes to the conservation of biodiversity and the sustainable use of its components. EU Biodiversity Strategy – includes the following aspects: taking urgent action in this area; protecting and restoring EU nature; creating conditions for achieving a complete transformation of the economy in favor of ecosystems and biodiversity; implementing the global bio-balance agenda [14]. Promoting a "blue economy" – this is expressed in the sustainable management of maritime spaces in order to use the potential of the sea to produce renewable energy. **Risks** They are mostly related to the unpredictability of the development of various natural phenomena, which is difficult to counteract despite all of the efforts and achievements in protecting ecosystems and biological species. In addition, non-EU countries have different ecosystem and biodiversity targets.
Food system – as vital system for consumers	Food production is an absolute necessity for the existence and development of humankind. On the other hand, the food industry inevitably pollutes environmental elements such as the air, water, and soil and contributes to reductions of biodiversity. There is the problem of significant food waste and, therefore, the waste it generates. Low-quality food products, diets, and regimens are problems for consumers' health and their relationship with the food system. **Purposes** Short-term objective: create a fair, healthy, and environmentally friendly food system and encourage consumers to consume sustainable food (including that which is healthy and accessible to all). Strategic objective: to establish European food as a global standard for sustainability and achieve the Farm to Fork Strategy. **Achievements** Developing the Farm to Fork Strategy in the context of the EU Green Deal. **Risks** Current production models cannot provide enough food for rapidly growing populations; this is a fact worldwide.

Table 1. cont.

Scope of problem	Purposes and achievements as well as possible risks
Mobility and transport	Consumer mobility and the overall development of the economy are closely tied to the condition of transport infrastructure and vehicles. On the other hand, transport is among the most active polluters of the environment; transport accounts for 25% of the greenhouse gas emissions in the EU. **Purposes** Short-term objective: achieving sustainable and smart mobility; tackling congestion. Strategic objective: 90% reduction of emissions in the transport sector by 2050. **Achievements** Sustainable and Smart Mobility Strategy – aimed at ensuring a smart and sustainable transport system in the EU [15]. Proposal for a regulation on the deployment of an alternative fuel infrastructure – supports the mass uptake of low- (even zero-) emission vehicles. The proposal covers all modes of transport [16]. Directive on streamlining measures to advance the implementation of the trans-European transport network (TEN-T) – aims to contribute to the creation of a single European area for transport and mobility [17]. Possibility of applying EU emissions trading to road transport in addition to existing carbon dioxide emission standards for vehicles. **Risks** The current proposals and projects for introducing sustainable and smart mobility cannot be implemented within the envisaged timeframes.

Source: authors' research in field of EU green economy

The policies that were discussed in Table 1 were in the context of the European Green Deal, which, in principle, defines the EU's overall vision "to transform the EU into a fair and prosperous society, with a modern, resource-efficient and competitive economy where there are no net emissions of greenhouse gases in 2050 and where economic growth is decoupled from resource usage" [8].

The achievement of the above purposes should be reflected in reducing the emissions of harmful gases. From this point of view, the article is interested in a study of the air emissions of harmful substances that are generated by the functioning of enterprises in the EU (including Bulgaria as a member state). The following section of the article presents and shows our research of statistical data at the European and national levels (for Bulgaria).

3. Data and Methods – Emissions of Pollutants in Air

Table 2 shows the emissions of some of the most harmful gases that are emitted in the air, such as carbon dioxide, methane, and nitrous oxide. The table contains information from the European Environment Agency and Eurostat [18] as well as information from the Executive Environment Agency with the Ministry of Environment and Water (Bulgaria) and the National Statistical Institute [19]. The emission

levels were determined by using a balance method that was based on the following indicators: consumed fuels, amounts of produced output and invested raw materials, calorific values, and emission factors that were applicable for the respective pollutants. The study covered enterprises from all economic activities – the functioning of which was related to the formations of emissions in the air.

Table 2. Emissions of pollutants in air (thousand tons)

Gas emitted	2018	2019	2020	2021	2022
European Union – 27 countries (since 2020)					
Carbon dioxide (CO_2)	3,062,616	2,917,622	2,639,189	2,814,920	2,748,554
Methane (CH_4)	15,002	14,640	14,496	14,377	14,085
Nitrous oxide (N_2O)	674	661	654	652	621
Bulgaria					
Carbon dioxide (CO_2)	43,577	42,267	36,644	42,425	46,994
Methane (CH_4)	242	232	228	235	234
Nitrous oxide (N_2O)	16	17	16	16	16

Sources: Eurostat 2024 [18]; NSI 2024 [19]

The data in Table 2 provided the reason to assume that the implementation of the EU's green and circular strategies benefits the environment and climate, as the quantities of the studied emissions decreased from 2018 through 2022. At the European level, the data reflected decreases in carbon dioxide, methane, and nitrous oxide emissions in 2022 as compared to 2018. The same trend was also evident in the study of pollutants (with minor exceptions), which decreased yearly as compared to each previous year. At the national level, the indicated data on the emissions of harmful gases into the atmosphere in Bulgaria demonstrated certain fluctuations; for example, an overall increase in carbon dioxide was registered (from 43,577,000 tons in 2018 to 46,994,000 tons in 2022). The calculated development indices give an even clearer idea of the outlined developmental trends (Table 3).

Based on the calculations in Table 3, it can be argued that emissions of carbon dioxide, methane, and nitrous oxide are decreasing in the EU and Bulgaria as a whole. However, attention can be drawn to the development indices in terms of the carbon dioxide emissions that have resulted from the activities of enterprises in Bulgaria. Calculated on a chain basis, these indices show growth; for example, the carbon dioxide emissions in 2021 were 115.8% as compared to 2020 – in 2022, these were 110.8% as compared to the previous year (2021). When calculated on a base basis that was compared to 2018, the indices showed a more favorable development, as they reported an overall decrease. An exception to this trend was 2022; during this year, carbon dioxide emissions were 107.8% as compared to 2018.

Table 3. Development of emissions of pollutants in air [%]

European Union – 27 countries (since 2020)	2018	2019	2020	2021	2022
Carbon dioxide (CO_2)					
Indices (in previous year)	–	95.3	90.5	106.7	97.6
Indices (in 2018)	100	95.3	86.2	91.9	89.7
Methane (CH_4)					
Indices (in previous year)	–	97.6	99.0	99.2	98.0
Indices (in 2018)	100	97.6	96.6	95.8	93.9
Nitrous oxide (N_2O)					
Indices (in previous year)	–	98.1	98.9	99.7	95.2
Indices (in 2018)	100	98.1	97.0	96.7	92.1
Bulgaria	2018	2019	2020	2021	2022
Carbon dioxide (CO_2)					
Indices (in previous year)	–	97.0	86.7	115.8	110.8
Indices (in 2018)	100	97.0	84.1	97.4	107.8
Methane (CH_4)					
Indices (in previous year)	–	95.9	98.3	103.1	99.6
Indices (in 2018)	100	95.9	94.2	97.1	96.7
Nitrous oxide (N_2O)					
Indices (in previous year)	–	106.3	94.1	100.0	100.0
Indices (in 2018)	100	106.3	100.0	100.0	100.0

Increased carbon dioxide concentrations are generally a problem; this indicates that the stricter implementations of the measures are necessary in the context of the Green Transition. These measures are related to the partial (or even complete) decarbonization of economic activities, including energy, transport, construction, and trade. Given the data that was reflected in Tables 2 and 3, it can be said that this also applies to enterprises in Bulgaria – even more so when considering the data from the World Air Quality Report.

For Bulgaria specifically, the World Air Quality Report ranked the country as an unfavorable 81st in 2023 (out of the 134 countries, regions, and territories that were surveyed) and placed the capital (Sofia) in the 2400th position for world cities

regarding air pollution from fine dust particles. It is assumed that these amounts were two-to-three-times greater than the levels that the World Health Organization recommended [20]. We should pay attention to the fact that more than half of the world's population is urban, and cities emit 75% of all CO_2 from energy use [21].

The problem of the air pollution that is caused by road traffic deserves increased attention. A study of this problem should be a priority – especially in those cities that are classified as smart cities (which must ensure a high quality of life for their consumers) [22]. At the same time, cities should focus on creating more housing in the context of densifying cities; this ensures their integrated use – for labor, work, and leisure. This, in turn, requires the provision of more green areas and good transport connectivity in order to create sustainable urban communities with reduced energy consumption and emissions [23].

Opportunities for reducing harmful emissions can be sought in absolutely all economic sectors. Undoubtedly, the EU's most ambitious target is to achieve the decarbonization of industry. Economic sectors are undoubtedly a source of pollution, but they can also be a vehicle for innovation that is in favor of green policies due to their growing place in the circular economy [24] as well as in construction and agriculture. In addition, trade also has enormous potential in the context of the green economy; this is because trade is dominated by most businesses that can be successfully used to stimulate many green practices (including the impact of consumers on the climate and the environment).

The article's authors discuss the roles of trade and consumers in the context of the Green Transition in Sections 4 and 5.

4. Role of Trade in Supporting Green Transition

An increasing number of companies are innovating in their activities, aiming for all sectors to develop in line with the EU's green policies. However, enterprises in the trade sector (G) are significantly more numerous and, therefore, play an increasing role in implementing green economy policies. Table 4 shows data on the numbers of enterprises by their economic activities (including those in Sector G) in the EU and Bulgaria.

The data that is reflected in Table 4 shows that, in general, the number of enterprises is increasing – both in the EU (from 22.5 million in 2018 to 23.2 million in 2022) [25] and in Bulgaria (from 413,500 in 2018 to 449,400 in 2022) [26]. The growth in the number of enterprises in Bulgaria (1.09 times) corresponds to the overall growth of European enterprises (1.03); this clearly outlines an increasing trend of the number of businesses, which will increase the impact of all of the economic sectors on the climate and environmental situation.

The figures in Table 4 show the number of businesses in trade (Sector G), which represent between 25 and 26% of the surveyed enterprises at the European level. Specifically, the data on the number of enterprises in Bulgaria shows that the highest

number is in Sector G. In practice, this means (or gives grounds to raising the hypothesis) that, as an economic sector, trade has a huge potential for implementing many green practices that benefit the climate and the environment.

Table 4. Number of enterprises by economic activities in EU and Bulgaria (2018–2022)

Economic activity			Annual				
			2018	2019	2020	2021	2022
EU (EU 27 since 2020)							
Enterprises in non-financial business economy			22,522,722	22,865,630	22,567,303	22,657,314	23,233,582
Enterprises in Sector G (% in total)			5,771,445 (26)	5,718,891 (25)	5,686,112 (25)	5,860,764 (26)	5,843,738 (25)
Bulgaria							
Enterprises in all NACE activities*			413,535	419,681	411,564	412,878	449,481
Enterprises by NACE codes	A	Agriculture, forestry, and fishing	19,923	19,265	19,126	18,579	46,119
	B	Mining and quarrying	368	343	350	338	336
	C	Manufacturing	31,874	31,601	30,502	30,328	30,226
	D	Electricity, gas, steam, and air conditioning supply	1,790	1,820	2,137	2,995	4,368
	E	Water supply; sewerage, waste management and remediation activities	823	843	829	855	846
	F	Construction	20,936	21,580	21,893	22,728	23,807
	G	Wholesale and retail trade; repair of motor vehicles and motorcycles	142,938	143,555	139,376	138,011	137,830
	H	Transportation and storage	23,449	23,304	22,555	22,670	23,006
	I	Accommodation and food service activities	27,330	27,473	25,618	24,635	24,794
	J	Information and communication	14,513	15,375	15,632	16,450	17,440
	L	Real estate activities	24,031	25,083	25,515	27,207	28,546
	M	Professional, scientific, and technical activities	46,935	48,129	47,648	47,960	49,909
	N	Administrative and support service	11,885	12,200	11,829	11,865	12,162
	P	Education	3,949	4,236	4,211	4,190	4,271
	Q	Human health and social work activities	14,140	14,281	14,287	14,365	14,649
	R	Arts, entertainment, and recreation	6,209	6,574	5,809	5,177	5,387
	S	Other service activities	22,442	24,019	24,247	24,525	25,785

* Except for K, O, T, and U.

Source: authors' calculations based on Statista 2024 [25]; Eurostat 2024; NSI 2024 [26]

Data on the relative share of enterprises in Sector G in Bulgaria is shown in Figure 2.

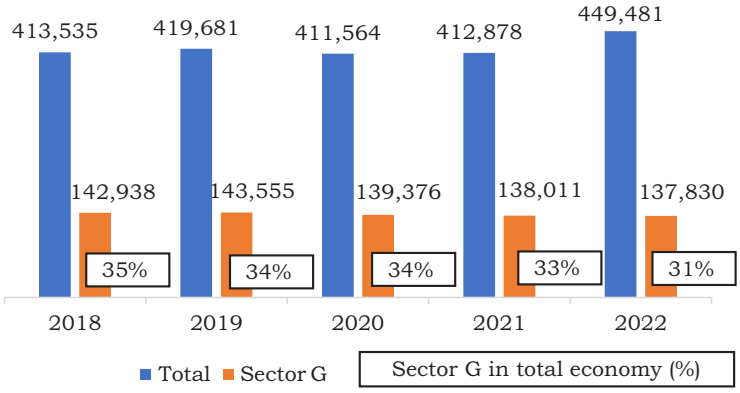

Fig. 2. Trade sector in total numbers of enterprises by economic activities in Bulgaria (2018–2022)
Source: authors' calculations based on NSI 2024 [26]

The relative share of commercial enterprises in Bulgaria varies between 31 and 35% over the different years of the study period, and their share is relatively constant over time (above 30%). This confirms the understanding that, through the huge number of enterprises at the European and national levels, trade can actively contribute to achieving the objectives of the Green Transition. As a business activity, this is most closely related to consumers and can, therefore, be used as a tool that influences consumer behavior in favor of the Green Transition.

The role of trade in the context of the Green Transition could be discussed in several key areas:

- field of construction of green sales premises,
- field of innovative equipment for sales premises,
- field of climate-neutral goods,
- field of complementary services in sales premises,
- field of sustainable employment of commercial workers.

Construction of Green Sales Premises

The aim is to implement environmental solutions such as green (sustainable) building at retail outlets (e.g., through compliance with ISO 50001 – 2018; the Excellence in Design for Greater Efficiency [EDGE] standard for green building, and the international certification system for green building). In this way, less energy is consumed during the operations of the commercial sites. In addition, green construction significantly reduces the need for water in the construction process. Another important aspect that is related to commercial premises (not only in terms of their real estate valuations but also in relation to their environmental friendliness) is their locations. From the point of view of the "time-distance" relationship that

retail premises have about key points (housing, schools, workplaces, offices, maintenance facilities of the sites, etc.) [27], the emissions that are released by the harmful gases via the means of transport are increased. In other words, the further retail premises are from other key sites and consumers, the more pollution there is.

Geographic information systems (GISs) are of key importance for the construction of commercial sites. This technology is generally used as an innovative in decision-making in urban planning and construction, transport, environment, agriculture, ecology, and health care [28]. Specifically in construction, GIS technology provides access to data and information that allows for the more efficient and environmentally friendly planning and implementation of construction projects (including in the field of trade). The application of this technology in Central and Eastern Europe is promoted and supported by the European Digital Innovation Hub (ECIH) in the construction sector. Among the founders of this hub were the Bulgarian Construction Chamber, the Chamber of Architects in Bulgaria, the Bulgarian Association for Construction Project Management, and others (including leading construction companies in Bulgaria). The role of ECIH in the construction sector is in the context of the digital transformation of the construction industry and the sustainable development of the country.

In addition to the problem that is discussed above, it should be added that, in recent years, the intensive development of e-commerce and the growing consumer preferences for online shopping have given impetus to various delivery models such as final-mile delivery, which lead to a reduction in the need for traditional retail space [29]. In this sense, we can expect a restriction on the construction of new retail outlets due to the reorientation of trade to the online environment (which will undoubtedly reduce the impact of Sector G on the climate and the environment).

Innovative Equipment for Retail Premises

Implementing innovative smart technologies in Bulgaria's retail outlets has been a trend for several years. More and more retail chains for fast-moving goods, malls, and other retail outlets are implementing smart technologies that save time for customer service, energy (for example, through equipment with LED lighting), and labor costs. The use of smart commercial equipment that is controlled with artificial intelligence optimizes the management of commercial operations and, at the same time, helps reduce the carbon footprint in nature. It should also be noted that the implementation of smart devices on retail premises creates a comfortable work and customer service environments.

Climate-Neutral Goods

The aim is to offer climate-neutral vegan and vegetarian food products. This also applies to non-food products, such as those that are made from 100% recycled plastic. These goods come with certificates that guarantee their environmental friendliness and fair origin. In this way, consumers are provided with sustainable

products that reduce their environmental impacts. In addition, the Circular Economy Action Plan encourages more reusable goods to be offered that are sustainable over time and that can be repaired. This is expected to lead to a substantial reduction in the carbon footprint that is generated by the overconsumption of goods.

Complementary Services in Sales Premises

Additional services in trade and retail have enormous potential in the context of the Green Transition. In addition to providing convenience to consumers, additional services stimulate many green practices. For example, a modern and global trend in the scope of the additional services that are offered by large retail chains is the provision of vouchers for discounts for shopping at their outlets for the redemption of plastic and glass bottles, caps, cans, batteries, and others. A large European fast-moving consumer goods chain is also developing in this direction – offering consumers eco-vouchers of specific values for returned bottles or cans. In this way, the retail chain creates commitments in consumer behavior regarding environmental protection and stimulates circular economy models such as recycling [30].

The separate collection of paper, plastic, and nylon in special containers that are located near the entrance and communication premises of retail outlets aims to instinctively attract consumers' attention and engage them in their behavior regarding nature conservation. Trade also contributes to the achievement of the ecological transition through the voluntary participation of retail chains in large-scale projects for cleaning and environmental protection. Environmental trade also assists by serving consumers with mobile applications that provide them with digitized fiscal receipts instead of paper ones, along with digitized advertising brochures instead of paper ones, digitized coupons for discounts on shopping, and other personalized offers in the digital format instead of analogue. In addition, retail chains encourage consumers to use reusable bags, eco-packaging, sustainable goods, and services in general.

Employment of Commercial Workers

Undoubtedly, one of the most significant roles of trade is related to stimulating growth and job creation. Therefore, EU policy stimulates the economic efficiency of the sector while promoting its environmental and social efficiency [31]. In addition to being directly linked to customer service and the realization of sales and profits, the work of employed trade workers under modern conditions builds on the ability to evolve for the benefit of the Green Transition. The achievements of environmental benefits from the work of employees can also be sought in the context of social entrepreneurship, which actively promotes the solidarity of enterprises with the environment [32].

In the context of green objectives, the functioning of retail outlets should include taking decisive actions toward promoting the creation of jobs that are in line with environmental requirements, thus supporting the overall sustainable development of companies [33]. In particular, the employment of retail workers in collaboration

with technology can contribute to achieving effects such as water and electricity savings and the circular management of packaging and waste from cardboard, paper, plastic, and nylon. Such waste is generated daily in the process of managing commercial operations.

All of the above-mentioned activities in trade as well as other similar activities in other economic sectors can contribute to the achievement of the Green Transition. However, its 100% realization is only possible with consumers' active and responsible participation in all actions that limit the negative impact on the environment and climate. From this point of view, the next part of the article examines the roles of consumers under the conditions of green transformation.

5. Role of Consumers under Conditions of Green Transition

"Consumers across Europe are showing a growing interest in contributing personality to achieving climate neutrality, preserving natural resources and biodiversity, and reducing water, air, and soil pollution" [34]. At the same time, consumer interest in the use of longer-lasting and sustainable products is increasing. The EU Circular Economy Action Plan includes measures that encourage businesses to provide consumers with reusable, sustainable, and repairable products. Consumer interest is also growing in the consumption of healthy foods and, in general, in healthier lifestyles, which is also relevant in a broader sense to the problems of the ecological transition.

The European Green Deal sets out a comprehensive strategy to transform the EU into a climate-neutral, clean, and circular economy with efficient resource use and reduced negative impacts on natural capital and biodiversity. This requires not only the decarbonization of the economy but also rapid changes in consumer habits and behaviors in order to reduce their environmental footprints in all areas (from housing and food to mobility and leisure) [35]. For example, "72% of all carbon dioxide emissions worldwide are connected to household consumption with food, shelter and mobility" [36]. "Consumer energy choices will be key to deliver on the new climate targets for 2030 and climate neutrality by 2050" [37]. This shows that consumers have enormous potentials and essential roles to play in realizing the Green Transition.

A challenge for the EU is to develop measures that maintain consumers' permanent interest in all aspects of the Green Transition and encourage them to adopt inclusive attitudes toward achieving it. Creating an inclusive attitude among consumers toward the goals of the ecological transition can be sought in their relationships and interactions with trade. In this way, the role of trade and consumers can be commented on as a strategic tool that is in favor of the ecological transition. The authors examined the role of consumers in several key areas: the climate, environment, circular economy, and digital environment.

Climate

Consumers have a direct impact on the climate, which can be seen in at least two ways: first, through the choice of the energy that they use to heat and cool their homes; and second, through the means of the transport that they use. When consumers choose cleaner technologies for heating and cooling their homes, they contribute to cleaner air; this also applies to their choices of cleaner modes of transport (e.g., air travel emits the most carbon dioxide per kilometer and the least when traveling by train; at the same time, this contributes to reducing noise emissions [including in urban environments] [38]). From this point of view (namely, the choices of the types of energy and transport that they use daily), the achievement of climate targets depends greatly on these consumer choices. It should be added that heating technologies are also establishing themselves as a leading factor for home purchases [39], which also contributes to solving climate problems (albeit indirectly).

Environment

Undoubtedly, consumers also have a direct impact on the state of the environment. Consumers' choices to use goods that have low (or even negative) impacts on the environment are directly related to achieving resource efficiency objectives, which aim to preserve and restore the environment. Consumers should be engaged not only in the long-term uses of goods but also in the conditions under which they are produced. In this regard, obtaining more information about the durability of a product plus its environmental impact can be decisive factors for purchases. Studies in the EU have shown that, when consumers receive such information, the sales of the most durable versions could almost triple; consumers are even willing to pay more for goods with longer durability lengths [40].

A modern trend that is related to environmental protection is the use of environmentally friendly products. In the media space, there are numerous advertisements for goods that contain claims of environmental friendliness or that the goods are produced and acquired through fair trade (that they meet the basic requirements for the protection of forests and waters, the climate, human rights, and the craft of farmers). The international non-governmental organization Rainforest Alliance created a logo that is indicated on products in order to ensure that they are consistent with the aspects of sustainable development [41]. Many manufacturers and traders are focusing on their contributions to the Green Transition by offering guarantees in three main directions: first, that their goods are healthy and free of unwanted ingredients (in other words, they are produced with care about consumers); second, that a form of circularity is used in the production of their goods (the consumption of raw materials is reduced, and the goods are produced with care about the environment without emitting greenhouse gases into the air); and third, that the production of goods encourages local entrepreneurship (for example, supporting the development of local farmers).

These examples do not exhaust the roles of consumers in the field of climate and the environment, as they make many other choices in their daily lives with which

they can also contribute to their protection; these include, for example, consumers' choices to dispose of household waste separately and safely, the use of reusable bags, and the avoidance of products with plastic packaging. All of these examples are relevant to environmental protection, as they help prevent plastics and other waste products from reaching our ecosystems. According to Eurostat, the per capita household waste that was generated in the EU was 515 kg in 2022; this amount was slightly more than in 2018 (500 kg) and 2019 (505 kg) but less than in 2020 (521 kg) and 2021 (534 kg) [42]. From this perspective, it can be said that consumers are demonstrating more-responsible attitudes toward household waste generation.

Circular Economy

The role of consumers in the circular economy should be sought in the context of the overall strategy for sustainable development: "development that meets current needs without compromising the ability of future generations to meet their own needs" [43]. In this sense, it is of great importance for consumers to choose to use their belongings for longer times; in this way, they can extend the life cycles of their products, their sustainability, and the possibility of their inclusion in the circular economy. Consumers are given numerous choices in this regard; for example, the right to repair the goods. In this regard, the EU enables the easy repair and maintenance of different types of goods by approving the directive on common rules that promote the repair of goods (Directive [EU] 2024/1799) [44]. This legislation aims to ensure both a high level of consumer protection and environmental protection; i.e., the directive indirectly reduces waste and the disposal of goods that can alternatively be repaired and used for more-extended periods. The right of consumers to repair their goods is key in the EU's 2050 Circular Economy Plan as well as in the context of the Green Deal.

In addition to the right to repair, consumers are provided with various forms of circularity that they can choose when deciding not to use items anymore; for example, recycling, freecycling, and other forms that facilitate the sharing, borrowing, gifting, or reuse of goods. It should be noted that trade supports the implementations of these activities to an exceptional extent. For example, the understanding that "clothing recycling contributes to the fight against global warming by reducing emissions" is among the concepts of a global network of organizations (including those in Europe) that supplies second-hand clothes to stores with the aim of having a positive impact on the social sphere and the environment [45]. The trade in second-hand clothes enables their longer-term use and reduces the adverse effects of "fast fashion."

The consumer-to-consumer (C2C) business model in shared economy platforms allows consumers to connect online and carry out a variety of activities, such as exchanging goods and services and gifting new or used items. From the point of view of circularity, a business model that allows consumers to buy a service rather than a product (product-as-a-service) is innovative and extremely effective; instead

of owning the product, they pay for a service that is related to it. This consumption model allows for greater interactions between consumers and traders and increased control over the product's use, with a view to its long-term and sustainable use.

In the commercial practice of fashion chains, there are known examples of collecting unnecessary clothes from consumers who are stimulated by discount vouchers when shopping in their stores. Examples of the re-inclusion of products in the circular economy are complemented by the practice of FMCG chains, which collect plastic bottles, caps, cans, batteries, and other waste from consumers. All of these examples are complementary services that are offered by sales premises, which are successfully used to stimulate various green practices in the daily lives of their consumers.

Digital Environment

In addition to the above examples, the role of consumers who are connected with the digital environment as a new environment of work and interaction should also be noted. This environment is not isolated – it is part of nature and the environment; therefore, measures to limit its pollution should also be applied. The digital environment is highly dynamic, as it reflects the integration of digital technologies such as artificial intelligence, the Internet of Things, cloud computing services, and social networks in all public spheres. At the same time, the dynamics of the digital environment are also a result of user activity; for example, more than two billion people use mobile applications worldwide [46], and there were 3.1 billion users of social networks [47]. The above data gives us a reason to assume that consumers are actually accumulating a huge footprint in the digital environment. In addition to the activities of the public spheres, this is formed as a result of the many daily activities that consumers perform in an online environment (including work, shopping, communication, information searches, content sharing, entertainment, sports and recreation, and education); so, their online activities lead to accumulations of huge amounts of data in cloud computing systems (which also generates a carbon footprint). Therefore, reducing one's digital footprint (as digital waste) depends on the choices of consumers to purposefully manage and store their information in the "cloud."

6. Conclusion

Regarding the issues that were discussed regarding the role of trade and consumers as well as their interactions in favor of the Green Transition, it should be emphasized that these problems are multi-layered and can hardly be exhausted within the framework of this article given the complicated nature of the challenges that face the Green Transition and the interests that they affect – business, consumers, and society. Moreover, these problems have been the subject of discussions for decades at the European and even global levels, which shows that the issue cannot be solved quickly and easily. This is why the current policies that are related to an

ecological transition have ambitious goals; in support of these, new and existing regulations and directives are systematically being developed and improved, thus providing a horizon and measures toward achieving the EU's green target. It is important to understand the need for a complete transformation of the economy from the perspective of the resources that are used with a view toward achieving climate neutrality and environmental protection. Trade and consumers play essential roles in this process of green transformation: as an economic sector, trade can be used as a conduit for many green innovations; on the other hand, trade is a daily business activity and, therefore, is closely related to consumers (and they play key roles in implementing the green economy and the circular models within it).

All of the issues that have been discussed in this article have shown that there are opportunities to use the interaction between trade and consumers in order to benefit green goals and the Green Transition.

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CRediT Author Contribution

M. D.: conceptualization, methodology, software, validation, formal analysis, investigation, resources, data curation, writing – original draft preparation, visualization.

I. K.: conceptualization, methodology, validation, data curation, writing – original draft preparation, review and editing, supervision, project administration.

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The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Data Availability

Requests for access to the data sets that were generated and/or analyzed in this research will be considered upon inquiry to the corresponding authors.

Use of Generative AI and AI-Assisted Technologies

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