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ENVIRONMENTAL GOODS AND SERVICES: DEVELOPMENTS OF THE CONCEPT, THE ECONOMIC SECTOR, AND THE MARKETS

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Abstract:

Green (environmental) marketing, which promotes cleaner, less detrimental products, is considered to be one of the main contributors to sustainable production and consumption. With the latest EU policy initiatives aimed at acceleration of green transition, it deserves even more attention while the concept of environmental goods and services still remains a subject for discussion, and both comparative environmental impact of some of such products and the green demand probably are overestimated. The studies offer an approach to the theoretical concept of environmental goods and services providing the integrated vision through the prism of the ecological economics, national accounting, and marketing with the initial point of green (environmental) needs. To understand full potential of marketing for environmental sustainability, which is of growing importance, the studies address the sole purpose environmental products also as those which are beyond the green marketing efforts, but playing the equally important role. Production of environmental goods and services by the EU economy is analysed with special attention to groups of products by their primary purpose, and conclusions are drawn regarding the sustainability potential of different fields of marketing.

Key words: *environmental goods, environmental services, green marketing, sustainability.*

1. Introduction

The European Marketing Agenda 2022 survey conducted by the Board of the European Marketing Confederation at the end of 2021 revealed that only 8.2% of respondents mentioned “Sustainable Products” to be one of the most important topics in marketing in Europe in 2022. The attention to the sustainability does not look to be insufficient when taking into account that the third place in the survey results is taken by “Brand Strategy & Management” topic with 30.6 % (European Marketing Confederation, 2022, p. 7) which often covers sustainability as a sub-topic, and the same does “Purpose-Driven Marketing” with 5.4 % (European Marketing Confederation, 2022, p. 12). It is noted that “aspects such as sustainability as well as social and ecological responsibility play an even greater role now than in the past from the perspective of brand managers” (European Marketing Confederation, 2022, p. 12). Two far-reaching impactful events happened in Europe in 2022, after the survey, might have shifted their attention to environmental sustainability even more or will do it for sure in the nearest future: the acceleration of green

transition of Europe to decrease the fossil fuel dependence due to the large-scale war of russia against Ukraine and the initiatives of the European Commission on Ecodesign for Sustainable Products Regulation (European Commission, 2022, European Commission).

Environmental (green) goods and services (EGS) contribute to the sustainability path of a society. Being in the centre between the production and consumption, they are in focus of the Sustainable Development Goal 12, and moreover, are a subject of monitoring the progress of the EU and its Member States who are committed to the United Nations 2030 Agenda for Sustainable Development towards the SDGs as a target indicator in value terms (Eurostat, 2022c, p. 218).

The role which marketing can play in promoting environmentally sustainable products (green/environmental goods and services) or sustainability in whole defines its contribution to the sustainable development goals. With a large body of publications in the field of green marketing and discussions on the concept, there is still a need to provide a broader vision of this field of marketing. The problem addressed in this paper is lack of integrated understanding of multiple-meaning essence of environmental goods and services as the means for satisfying human needs and different types of such goods in marketing context.

This study is focused on the environmental goods and services via the lens of the ecological economics, national accounting, and marketing. It proceeds from the importance of understanding full potential of marketing for environmental sustainability.

2. Aims of the studies and questions raised in the article

The aims of the studies are as follows:

– To approach the concept of environmental goods and services from different perspectives offered by ecological economics, national accounting and marketing;

- To differentiate marketing approaches by addressing basic marketing concepts and to define green/environmental marketing scope;

– To evaluate the sector of environmental products and to compare it to the available data on green markets dynamics;

– To define the potential for sustainability of main groups of environmental products.

Research questions:

– What are the green (environmental) needs and how are they satisfied?

– Sustainable products & Products for (environmental) sustainability. Are they the same?

– What is the potential of marketing in approaching sustainability? Does green marketing represent full environmental sustainability potential of marketing and have the transformative power strong enough? How to activate the potential of all fields of marketing for the environmental sustainability? “How may the marketing discipline “yet contribute to progress towards greater sustainability” (Peattie & Crane, 2005, citation from Laheri et al., 2014, p. 149)?” – the question still remains on the agenda.

– What are the main drivers of growth of the environmental goods and services sector (EGSS) of the economy (if it is growing)? What part of the sector is more important driver of positive impact on the environment or is growing faster? Analysis by NielsenIQ

(NielsenIQ, 2018) stresses with the optimism that the 2018 was the year of the influential sustainable consumer, moreover it's soon to be the decade of the sustainable shopper. Is it a consumer (final or intermediate) who is influential or is it regulations?

The paper is structured as follows: in the first section the "green" filter is applied to basic marketing concepts (needs, wants, demand, choice), the review of theoretical concept of green/environmental goods/services is done in relation to the green/environmental and general (conventional) marketing and the potential of both for environmental sustainability. Then the development of the EGSS is analysed on the macrolevel for the EU and for some leading countries with special attention paid to the dynamics of two groups of environmental products which are in the focus of the green (environmental) marketing and the conventional one.

3. Method

To operationalize the research objectives, the following research methods are applied: a theoretical examination of the concept of environmental goods and services, the quantitative analysis of the economic sector producing environmental goods and services based on the official statistics for the EU and some countries, with the breakdown by main product groups according to their primary purpose. The approach used is the integration of vision of environmental goods and services offered by the environmental economics, national accounting, and green marketing with the macro-marketing prospective. The author proceeds from tracing the "green" facet applied to the fundamental marketing concepts of needs and demand. In marketing context, traced is the nexus "a need → value/importance of means for satisfaction of the need → identification of the exchange, social units involved, specific response sought → marketing program" by applying P. Kotler's generic view of marketing (Kotler, 1972).

4. Literature review: Debates on environmental goods and services

The environmental (green) goods and services, as the means for satisfaction of specific human needs, are a subject for studying by both multiple academic disciplines (marketing, ecological economics, environmental economics, statistics and national accounting) and institutions. This specific group of goods and services gave rise to a specific field of marketing with a number of titles – ecological, green, environmental.

There is a long history of disputes on environmental goods and services concept on the panels of organisations dealing with the international trade (Dai et al., 2021; Bontadini & Vona, 2022; Monkelbaan et al., 2021; Bucher et al., 2014). Just to demonstrate the extent of variance on this issue, we refer to F. Bontadini and F. Vona who refined the list consisting of 902 green products to 221 positions (Bontadini & Vona, 2022, p. 8). The indicative compendium of environmental goods and services of the EU with 46 types of products is provided by the Regulation 2015/2174 (European Commission, 2015).

Such divergences encourage further investigation of this category of products. There is a triple meaning of environmental goods and services concept: the first one is used in ecological economics, the second one – in statistics and national accounting, and the third

one – in marketing and general economics. The basis for all of them are the ecological/environmental needs of both the individual and the society at large as well as benefits of satisfying those needs. Our approach is interdisciplinary and refers to the concept of needs as the basic one.

5. Findings

5.1. Theoretical framework

Ecological/environmental needs and satisfaction of green demand

Marketing for sustainability starts with understanding the needs of the customers (Fig. 1). Environmental goods and services are those that satisfy the ecological/environmental needs of people and organisations (institutions). What are the ecological/environmental needs and how can they be satisfied? Who satisfies the needs? The author defines ecological/environmental needs as those associated with the felt of deprivation with the material and nonmaterial benefits of natural environment in regard to existential or purpose-driven tasks of individuals or economic agents.

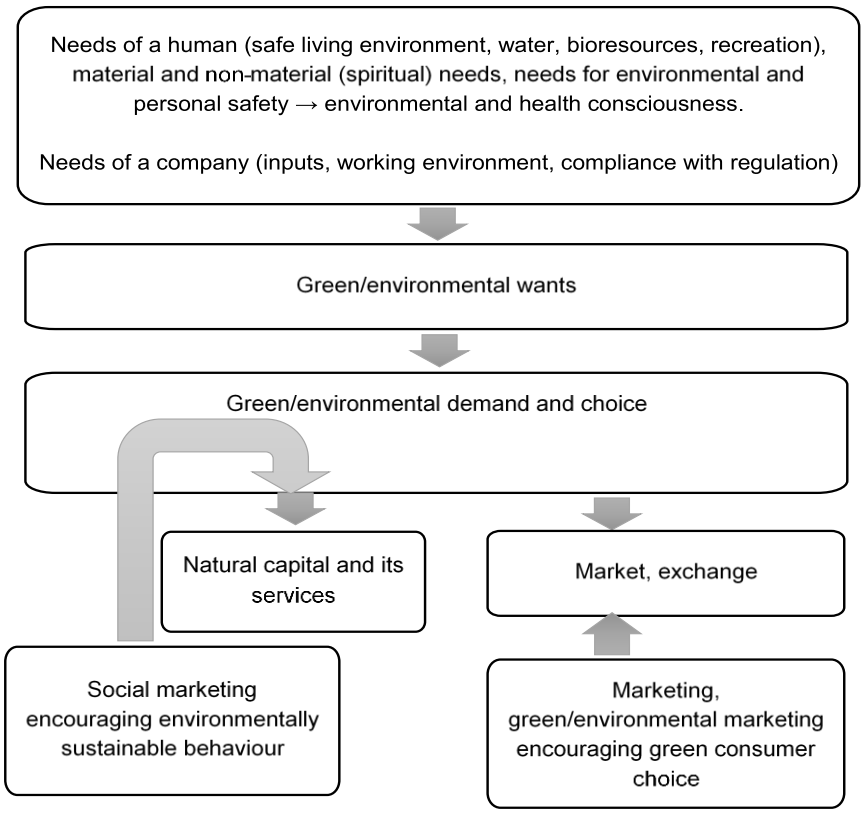

Fig. 1. Application of green/ecological/environmental attributes to the basic marketing concepts

Source: the author's own work

Individual green/environmental demand for benefits provided by the environment comes from the dependence of a human as a biological specie, living organism, on natural processes, his integration into the ecosystems, and his social needs (Fig. 2) which often are implemented as an unlimited wants and non-sustainable consumption behaviour models. Individual green/environmental demand for economic products is often based on a mixture of motives adding personal health consciousness to the environmental concern (Vrublevska & Kostenko, 2004). One should consider the need for environmental safety or personal safety (both based on reducing the risks coming from the external environment) as different motives for buying behaviour. Environmental consciousness causes actions for the sake of the natural environment (which are in part altruistic) while personal health consciousness causes actions for the consumer himself. When considering the means for satisfying the ecological/environmental needs, we apply traditional marketing concepts of goods as physical items and services as activities or benefits with the peculiarities pertaining to each of them (Eurostat, 2016, p. 16). Groups of EGS produced by the economy are presented on Fig. 2 according to Annex V of Regulation (EU) No. 691/2011 (European Parliament, Council of the European Union, 2011).

Industrial green/environmental demand is the demand of organisations which are the intermediate consumers in value chain. The demand arises due to their dependence on goods and services of the environment as factor inputs (taking into account the specifics pertaining to every economic process/industry and its place in the value chain), the need for a quality working environment, and the need to perform environmental obligations of organisations taken over either mandatory or voluntary, or in other words, to possess some environmental permission/allowance/good as a precondition for main operations (Fig. 3).

The category of green/environmental demand – demand driven by the environmental needs, demand for the benefits of natural environment sustainably supplied – embraces much broader number of exchanges than the green marketing offers. Table 1 summarises essential features of marketing in different sustainability contexts as developments of P. Kotler's framework (Kotler, 1972).

Environmental goods and services: the concept and the coverage

In environmental economics the resources supplied and functions performed by natural environment are environmental (ecological) goods and (ecosystem) services (Daly & Farley, 2004, p. 57; Chen & Kelly, 2022; SER International, 2007, p. 321). In terms of the System of Environmental-Economic Accounting (SEEA) as a statistical framework for satellite national accounting the ecosystems provide services – contributions to benefits used in economic and other human activity – which are of three types: provisioning services of ecosystems as material benefits of environmental assets; (b) regulating and (c) cultural services as non-material benefits of environmental assets (United Nations, 2014, p. 14). In the SEEA, it is emphasised that "environmental goods and services [economic products – O.V.] are different from ecosystem services" (United Nations, 2014, § 4.31) but in other environmental context the terms are used interchangeably.

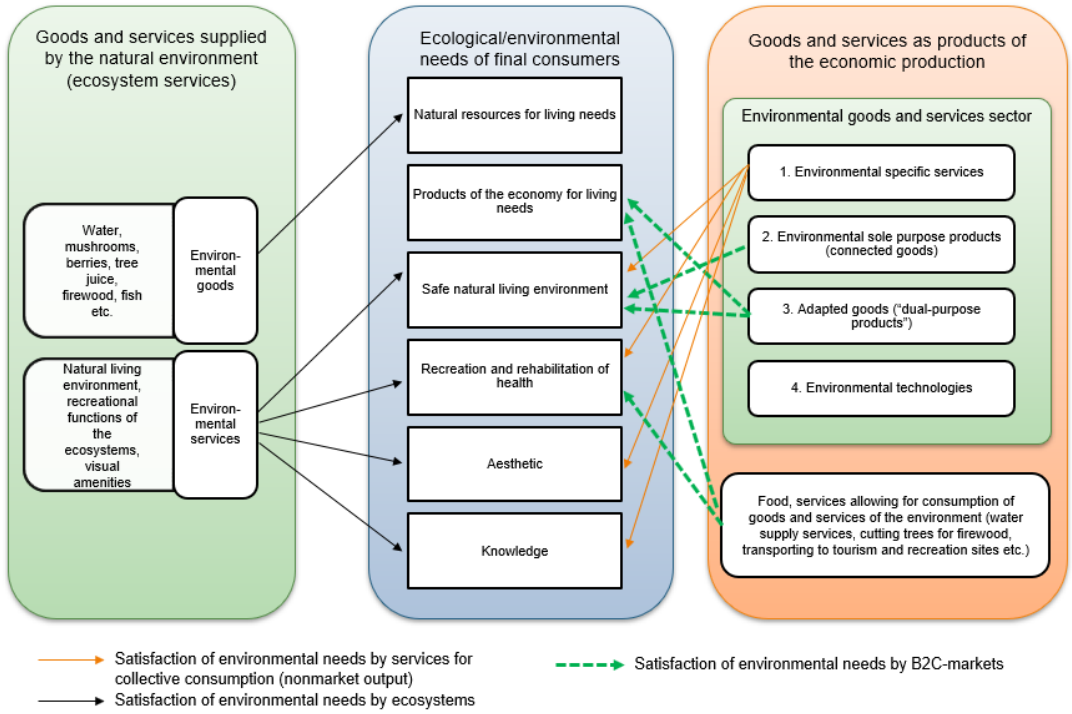

Fig. 2. Satisfying environmental needs of final consumers

Source: the author's own work

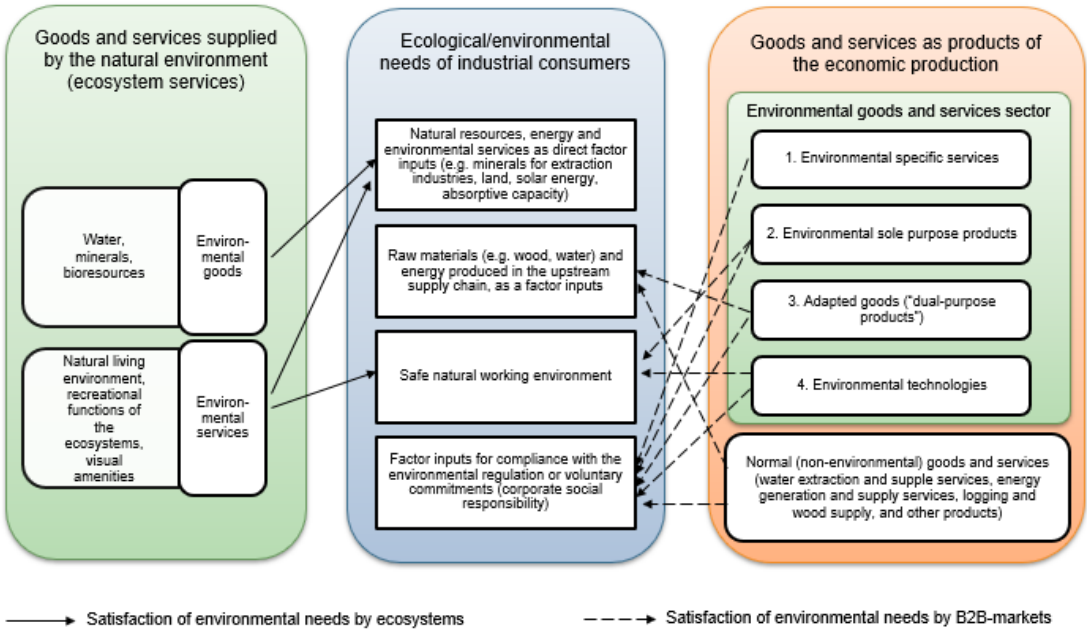

Fig. 3. Satisfying environmental needs of intermediate consumers

Source: the author's own work

Table 1. Marketing for sustainability

Source: the author's own work

End purpose of marketing efforts for sustainability	Environmental sustainability		
Environmental needs	Individual existential/ subsistence needs	Individual or institutional environmental needs as the secondary ones	Institutional or individual (households') needs of goods of the natural environment due to the environmental regulations or stakeholders' expectations
Means for satisfaction of the need	Benefits directly supplied by the environment	Products of the economy for non-environmental primary use providing also environmental benefits (green products)	Products for environmental sustainability: 1) Products of the economy specially produced for environmental purposes, specific environmental technologies (end-of-pipe technologies) 2) Integrated (cleaner) technologies 3) Non-environmental products to be used in environmental activity
Social object to be marketed	Idea of sustainability and decreasing risks applied to the consumption patterns; environmental values	1) Green goods and services with the environmental benefits as a by-product sold 2) Institutions producing and using/consuming such goods	1) Products for environmental sustainability 2) Institutional users/ consumers of such products are marketed downstream the supply chain
Social units involved	Marketers – public bodies, NGOs; market – society in whole or target social groups	1) Marketers – producers of green products; market – target final consumers (B2C context) and intermediate	1) Marketers – producers of products for environmental sustainability; market – target intermediate consumers (B2B context) and final consumers (B2C

		consumers (B2B context) 2) Marketers – institutions producing and consuming such products and promoting themselves; market – investors, partners downstream the supply chain, and general publics	context) 2) Marketers – institutions using/consuming products for environmental sustainability and promoting themselves; market – investors, partners downstream the supply chain, and general publics
Specific response sought	More sustainable consumer behaviour and living style due to discouraging excess demand and overconsumption	Consumer preferences/ choice of more environmentally friendly alternative	1) In regard of goods and services – conventional consumer buying behaviour 2) In regard of marketing of organisations based on their environmental performance – target group preferences/choice of more sustainable organisation
Marketing features	Social marketing	Green/ environmental marketing	1) In regard of goods and services – conventional marketing 2) In regard of marketing of organisations based on their environmental performance – green/environmental marketing

The review of marketing definitions of green products of the economic production and the characteristics associated with them is done by R. Dangelico and P. Pontrandolfo (Dangelico & Pontrandolfo, 2010). Their own definition is based on the type of product impact on the environment: “a product can be considered green, in terms of one of the three types of environmental focus, if it has an environmental impact lower than conventional products, or if it has a null impact, or if it positively contributes to environment, reducing environmental impact of other products” (Dangelico & Pontrandolfo, 2010, p. 1611).

The statistical definition of environmental products is based on their contribution to environmental purposes: “environmental products are products that have been produced for the purpose of environmental protection and resource management” (European Parliament & Council of the European Union, 2011). It should be noted that the definition does not emphasise whether the purpose is primary or secondary. The primary, intended product use

may be non-environmental, but the product is treated as an environmental one due to the secondary, environmental purpose (benefit).

There are four groups of environmental products (United Nations, 2014; European Parliament & Council of the European Union, 2011). Being aggregated by Eurostat to two groups (Eurostat, 2016, p. 15) the typology better reflects the prior purpose of the products. This has its rationale from the marketing viewpoint and also suits better for marketing analysis. The groups are as follows (Eurostat, 2016, p. 15):

1. Environmental specific products: environmental specific services, connected products, and most environmental technologies.

2. Cleaner and resource efficient products: adapted goods and some environmental technologies ("integrated technologies" – equipment whose use in production processes is less polluting and resource intensive than the use of equivalent normal technology) (Eurostat, 2016, p. 15).

The primary purpose of production of the first group of products (EGS1) is to improve the environment while for the second group of products (EGS2) it is to satisfy other needs. The boundaries of EGS2 are in line with the definition of green products (European Commission, 2013, p. 3). Products with the positive environmental impact are different from those constituting the environmental specific products due to their primary purpose. Proceeding from the idea of (environmentally) sustainable development (Daly & Farley, 2004, p. 6) the sustainable products are EGS2, while products for sustainability are EGS1.

Thus, there are three types of objects which can be exchanged and whose consumption impacts the state of the environment: sustainable products, products for sustainability, and ecosystem services.

The EGS producers are: corporations, households, public institutions, NGOs (non-profit institutions). EGS1 are produced: 1) for market by the specialised producers; 2) as a result of ancillary activities of economic agents; 3) or by public entities as public goods (non-market output). EGS2 mainly constitute the market output of sector of corporations (Fig. 4).

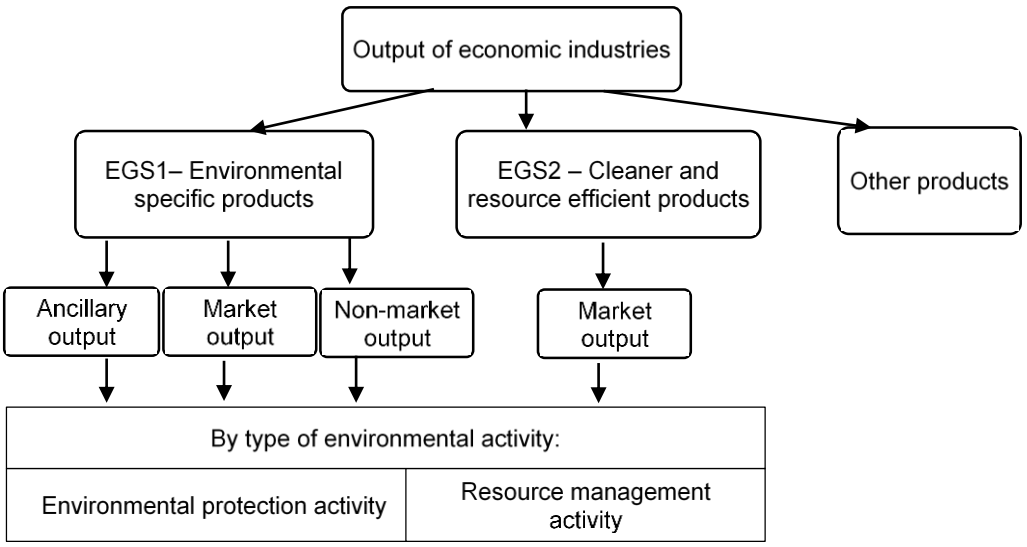

Fig. 4. EGS: economic output characteristics

Source: the author's own work

Environmental protection expenditure as an industrial demand for EGS

The bulk of studies on EGS covers the B2C context. C. Gelderman et al. (Gelderman et al., 2021) investigate the B2B context with focus on satisfaction of people – professional buyers working in the buying organisation from green purchasing. While the personal preferences do play a role in organisation's purchasing, they, nevertheless, are not the decisive factor for green demand of an organisation. The study of E. Fraj et al. (Fraj et al., 2013, p. 397) analyses the influence of a green marketing strategy on the performance of business-to-business organisations noting that "…environmental management has been underresearched in the context of business-to-business (B2B) relationships".

V. L.Vaccaro defines the B2B green marketing as "a wide range of activities" (Vaccaro, 2009, p. 315). Prakash (2002) notes that "Green marketing subsumes greening products **as well as greening firms**..." (citation from Vaccaro, 2009, p. 316, emphasis added). Such interpretation of green marketing is much broader than those focused on products only. It means that green marketing is not only promotion of products but also promotion of companies based on their improved environmental performance. The greening of firms needs environmental expenditure.

Decrease of the environmental footprint of industrial organisations, and hence – of their products, is crucially dependent on ancillary environmental activity of a company which is not quite transparent due to the integration to the main activity as a supportive process. Ancillary activity can be interpreted as production of environmental protection services (Eurostat, 2017, p 26) or of environmental outcome/effect in the form of prevention, mitigation, diminishing environmental harm which is also the creation of value by reducing harmful organisational activities or outcomes, negative environmental effects, noted by M. Polonsky et al. (Polonsky et al., 2003, p. 347) (Fig. 5, a manufacturing company is taken as an example, the resource management activity is not investigated).

The output of ancillary environmental protection activity as a supporting activity is produced for environmental protection purposes and internal use. Allocation of company's resources for ancillary production of the environmental output (attainment of prescribed environmental goals or performance of mandatory environmental measures), the "exchange" and "use/consumption" of it take place inside the organisation. As a physical process it cannot be separated from main activity. The value created is a value of environmental protection services (belonging to the EGS1 category). It is produced in-house as the ancillary output for internal use to reduce the environmental impact of the main production activities (Eurostat, 2017, p. 14; Eurostat, 2022b). The value is melted in the value of the principal output, that is why "extraction" of it is challenging.

Ancillary environmental activity generates the demand of a manufacturing company for resources. The resources to be bought are equipment, materials, energy which are mainly goods of EGS1 (environmental specific products) while they can also present the EGS2 group, environmental technologies and non-environmental goods (Fig. 5, the case describes the context for a company which is not producer of sole environmental purpose goods (services), hence there is no market output of EGS1). Because we define green demand as that one proceeding from the green needs then it also can be considered as coming from the green needs of the producer to comply with the regulation (Fig. 3). Part of current/operational environmental protection expenditure, which is the value of goods

bought for intermediate consumption and investment in environmental technologies, are measures of green industrial demand. Other components of current/operational environmental protection expenditure constituting the value of environmental services produced by the ancillary environmental activity are compensation of employees, depreciation of the stock of assets, and taxes. Investment in cleaner environmental protection fixed assets (integrated technologies) and specific environmental protection fixed assets (end-of-pipe technologies) are capital environmental protection expenditure.

Data on environmental protection expenditure of manufacturing companies can be used as the demand side information about industrial demand on EGS (Eurostat, 2016, p. 28); trends in environmental protection expenditure outline changes in green industrial demand.

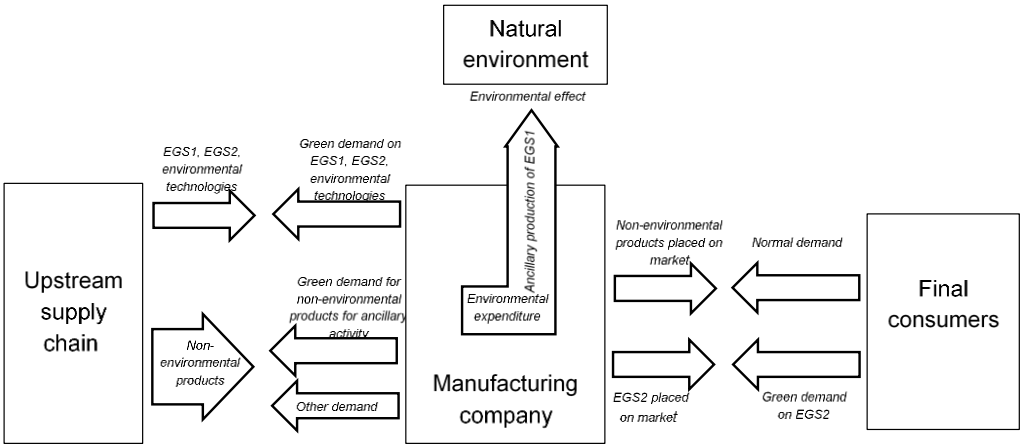

Fig. 5. Green demand in B2B and B2C context

Source: the author's own work

Marketing of EGS

EGS1 is considered under the traditional marketing theory and practice – marketing of products for environmental sustainability, or environmental specific products, which are specially produced for solving environmental problems. Production of EGS1, both as an ancillary activity and for the market, is of growing importance, as being part of supply and value chain it impacts the environmental footprint of products and organisations, and hence is an issue of marketing the organisations. Promotion of environmental specific products (EGS1) – marketing for sustainability – contributes to the resource management and protection of the environment and, finally, to strengthening nature capital. Customers can buy such products voluntary or being under the pressure of regulations and thus cause positive environmental impact.

EGS2 is a social object promoted by the green marketing according to the dominated definition of the latter.

The idea of sustainable use of goods and services supplied by the environment, and environmental values are promoted by means of social marketing "using the power of

upstream and downstream marketing interventions to encourage sustainable behaviour" (Gordon et al., 2011, p. 146).

All three types of marketing contribute to the environmental sustainability while the comparative environmental effectiveness of marketing efforts, the "transformative power" of marketing by M. Polonsky (Polonsky, 2011), is differing.

There is a number of studies on green (environmental) marketing concept including the systematic review of literature (Dangelico & Vocalelli, 2017; Laheri et al., 2014). Most of the definitions of green marketing as a type of marketing covered by these reviews are based on the comparative advantages of the products promoted as less detrimental (more environmentally safe). Few of them are broader (Jain & Kaur, 2004, and Peattie, 1995, citations from Dangelico & Vocalelli, 2017, p. 1266).

Green marketing is a marketing of more environmentally friendly goods and services compared to the alternatives – so-called cleaner and more resource efficient products. It exploits green themes in communication messages when promoting goods intended for non-environmental purposes and associated with product environmental footprint. Environmental benefits are a new source of added value (Ottman, 2011, p. 110). Green B2C marketing satisfies both the environmental and health consciousness of consumers.

Because green marketing is responsible for the products with primary non-environmental use (EGS2) and largely addresses individual consumers, it faces its limits in individual human behaviour. Numerous research works confirm positive relationship between green brand equity and its drivers – green brand image, green satisfaction and green trust – while these findings also confirm the limitation of green marketing transformative power. Green benefits as the additional benefits (by-benefits) of products, as a kind of "by-product" associated with an item of goods or service, can satisfy "green by-demand". Satisfaction of it comes from the realised by a customer, clearly declared **and** financially supported environmental needs.

In 2011, M. Polonsky stressed that "**green marketing is not achieving its potential** for improving the quality of life of consumers while improving the natural ecosystem" (Polonsky, 2011, p. 1311) (emphasis added).

This is because green marketing relies on human nature aiming satisfaction of needs according to the individually perceived priorities. The solution to the problem of weak transformative power of marketing, to our mind, is not only in making more efforts leading to an increase in sales of cleaner and more resource efficient products (EGS2), but in encouraging both the individual and – what is even more impactful for the final goal – the industrial demand for environmental products solely serving the environmental sustainability purposes (EGS1). The latter means rising environmental priorities over the organisational objectives.

When we consider green marketing as an integrated approach (Polonsky & Rosenberger, 2001, p. 23), then it leads to the business decisions on minimizing harm with available technologies (including investing in environmental sole purpose products), which, in turn, becomes a matter of cost and sharing them with the consumers.

The role of marketing in regard to the direct consumption of EGS supplied by the environment lies in impacting consumer behaviour by offering and sharing values of

sustainability, so this is a sphere for social marketing which is based on the broadened paradigm of marketing (Shaw & Jones, 2005).

What are the values the social marketing promotes being "almost exclusively a tool of not-for-profit organizations and governments" (Dangelico & Vocalelli, 2017, p. 1268)? Ecological economists developed a framework for the total economic value (TEV) of the environment which includes the use value (further decomposed to the direct use value, indirect use value, and option value) and non-use value which includes bequest value and existence value of a natural asset (M. Türker et al., 2003). Every component of TEV is described and measured in terms of exchange via the consumers' willingness-to-pay or willingness-to-accept indicators representing specific application of generic exchange concept. Promotion of non-use and option values is aimed at more environmentally beneficial behaviour and personal restrictions. In the latter case it can be considered as a demarketing – a tool of social marketing (Dangelico & Vocalelli, 2017, p. 1268).

5.2. Empirical analysis

The scale of EGSS

The estimations of market size for EGS (European Commission, 2013; Vantage Market Research; Laricchia, 2023) are so differing that it looks impossible to get to the convergence point. In fact (Fig. 6), from the production side, it amounted to 799 billion euro of the total output of EGSS in 2019 instead of 1.16 trillion euro which could have been expected proceeding from the estimations presented in 2013 (European Commission, 2013, pp. 3-4).

The supply-side approach is based on information about actual production of EGS in the past. To date, the sector producing environmental goods and services (EGSS) is formed in the national economies, but the measurable (mandatory reported) part of it is limited, although it is quite well shaped. The scale of the activities allows for understanding the total size of the economy producing the environmental products and products for the environmental sustainability and its dynamics. The data available to now allow for evaluation of its minimum size only, while the statistical methodology is developing, implementation is expanding, and coverage of the sector is steadily improving.

The analysis of the size, growth and structural elements of EGSS is aimed to address the policy questions (Eurostat, 2016, p. 83). In the context of the marketing analysis, the outcome can be assigned also to effectiveness of marketing activities. Although the level of data aggregation is very high, this can shed some light on the role of green or conventional marketing, that is why the focus of the analysis needed is on breakdown of the sector data by types of products.

Fig. 6 presents 2.7-times growth of the nominal output of the European Union's EGSS (in current prices) during the period 2000-2019 to 799 billion euro, or average annual increment 4.7 % (the author's own calculations based on the Eurostat data) after 2014. The gross value added (GVA) as a chain-linked volume demonstrates the 1.88-times growth and annual average increment of chain-linked volumes 3.7 % (the author's own calculations based on the Eurostat data). The dynamics of EGSS GVA since 2010 is ahead of those for

GDP with indexes 126.7 and 114.4 respectively to the level of 2010 in 2019 (Eurostat, 2022c, p. 228).

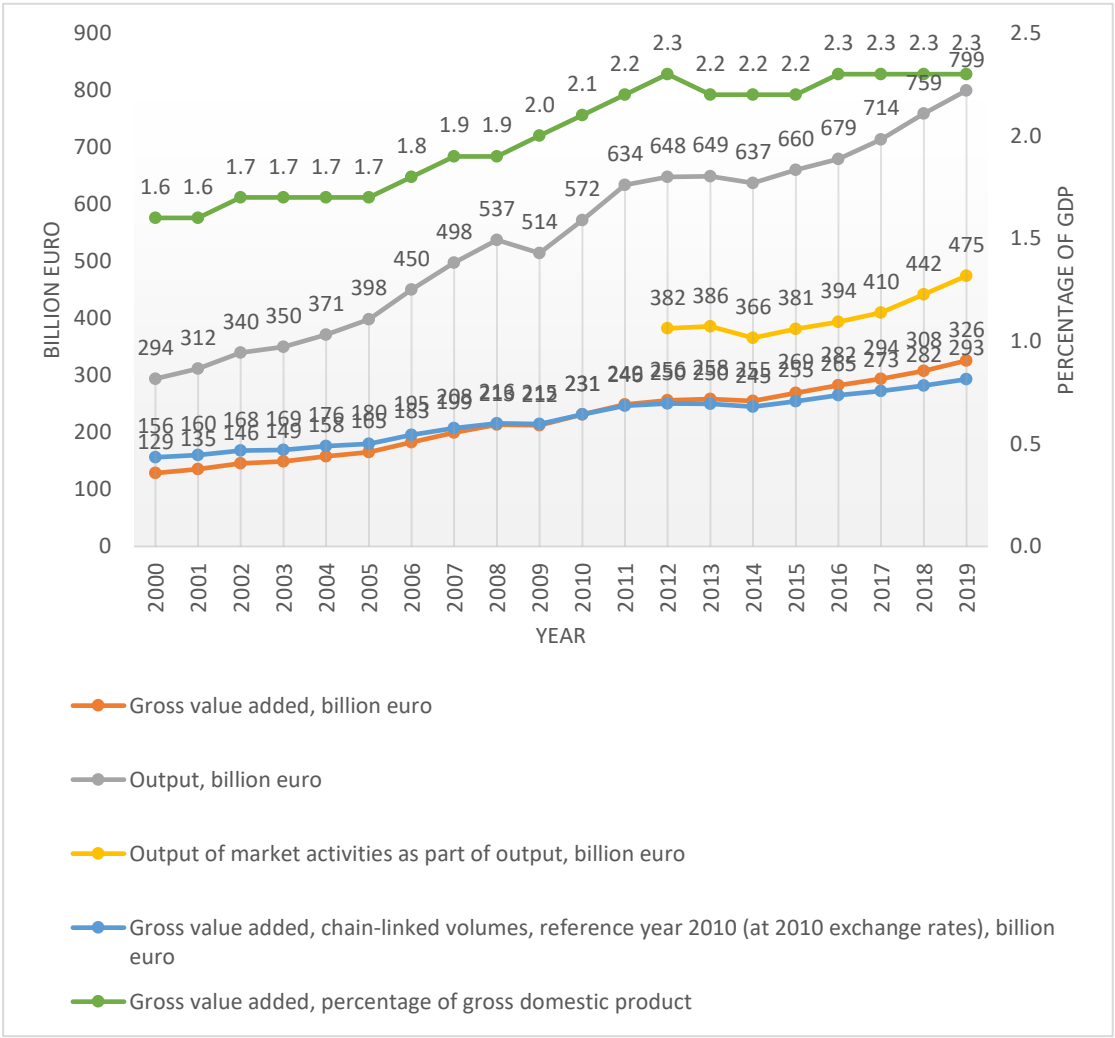

Fig. 6. Total EGSS of the EU-27. Output and gross value added
Source: compiled with the Eurostat data by the author

The GVA component is 41 % of output at the end of the period. The difference between the sector's output and GVA equals intermediate consumption.

Five countries with the largest size of EGSS (Fig. 7) constitute 60 % of the EU sector and at the same time all of them demonstrate lower shares of GDP than the EU average (Fig. 8). Since 2011 GVA of EGSS as percentage of GDP has been quite stable at 2.2-2.3 % for the EU and represents a contribution of the sector to GDP. At the same time, there is a considerably higher contribution of the sector to the national economies of Finland, Estonia, Austria and quite higher – for Sweden, Denmark, Switzerland, Bulgaria, Romania, Luxembourg, Lithuania, Latvia, and Poland (Fig. 8).

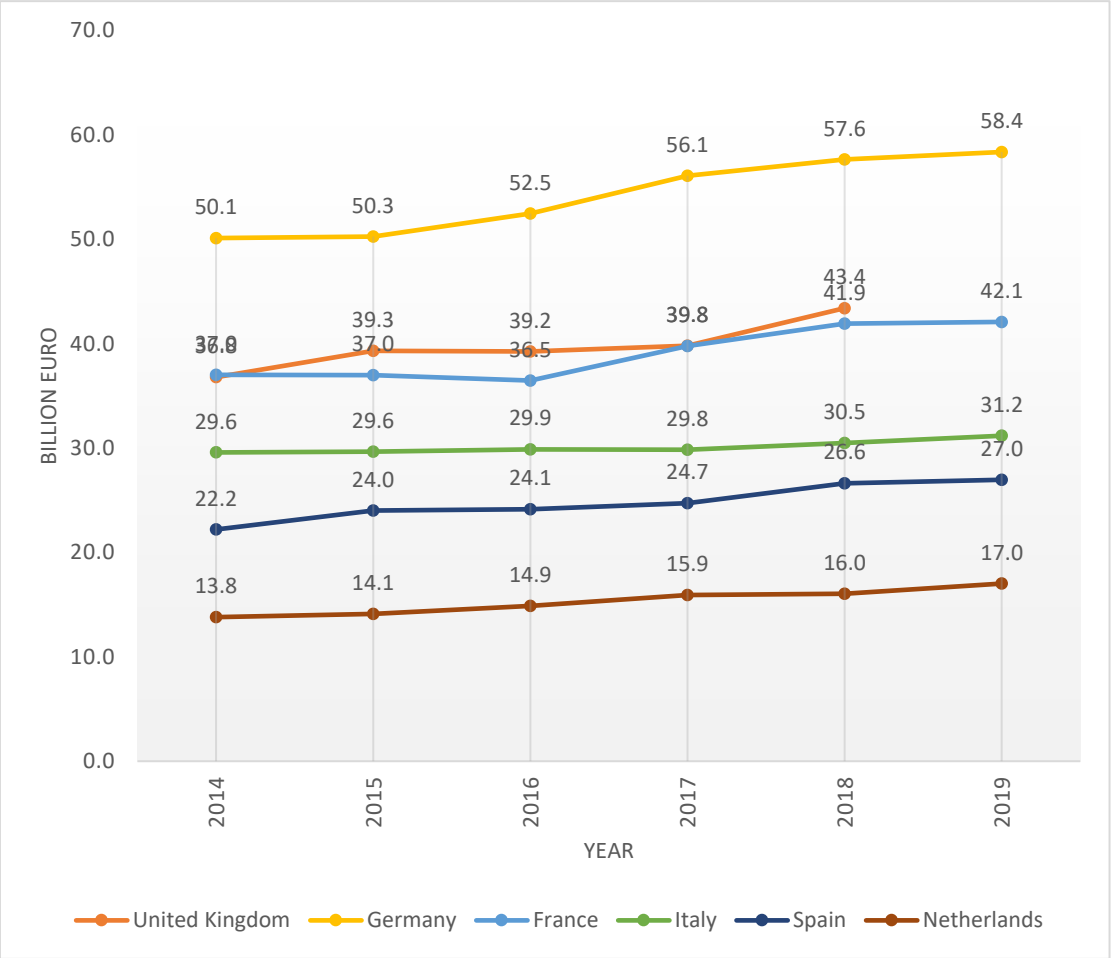

Fig. 7. EGSS of 5 leading countries of the EU-27 and the UK. Gross value added, chain-linked volumes, reference year 2010 (at 2010 exchange rates)

Source: compiled with the Eurostat data by the author

The analysis of EGSS by industries (Fig. 9) makes transparent the distortions in their contribution with 43 % for “Electricity, gas, steam and air conditioning supply; water supply; sewerage, waste management and remediation activities” and only 6 % for “Agriculture, forestry and fishing” revealing the limits of the methodology. To judge about the relative contribution of industries to the environmental sustainability and environmental safety of society, one should take into account the fact that reproduction of ecosystems and strengthening their capacity to provide non-market services for society – a contribution by a number of activities within the “Agriculture, forestry and fishing” – are beyond the coverage of the EGSS statistics. Besides, the activities related to forest management are not covered by the dataset (Eurostat, 2023).

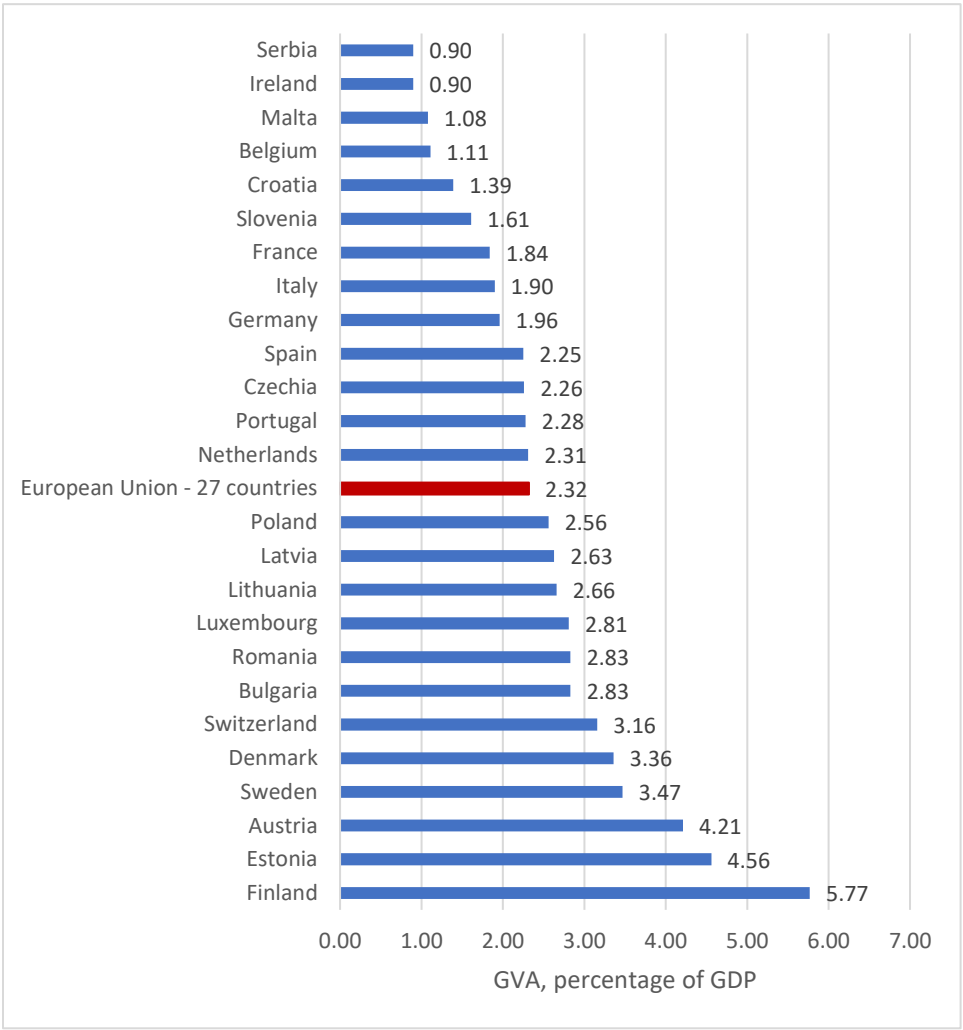

Fig. 8. GVA of EGSS in 2019 by EU countries, percentage of GDP

Source: compiled with the Eurostat data by the author

Product groups in EGSS

There is lack of details for environmental product groups on the EU statistics level. The aim of separating these groups is to get data breakdown to sole environmental purpose products (EGS1) and cleaner products (EGS2).

According to the Eurostat statistics methodology (Eurostat, 2022a), the total market output covers three groups of products:

1) environmental specific services;
2) cleaner and resource efficient products;
3) other environmental products.

Only the first two categories are reported separately. Hence, for the purpose of our research we take statistical data for “cleaner and resource efficient products” as EGS2 and the difference between the total market output of EGS and “cleaner and resource efficient products” as EGS1 (Fig. 10).

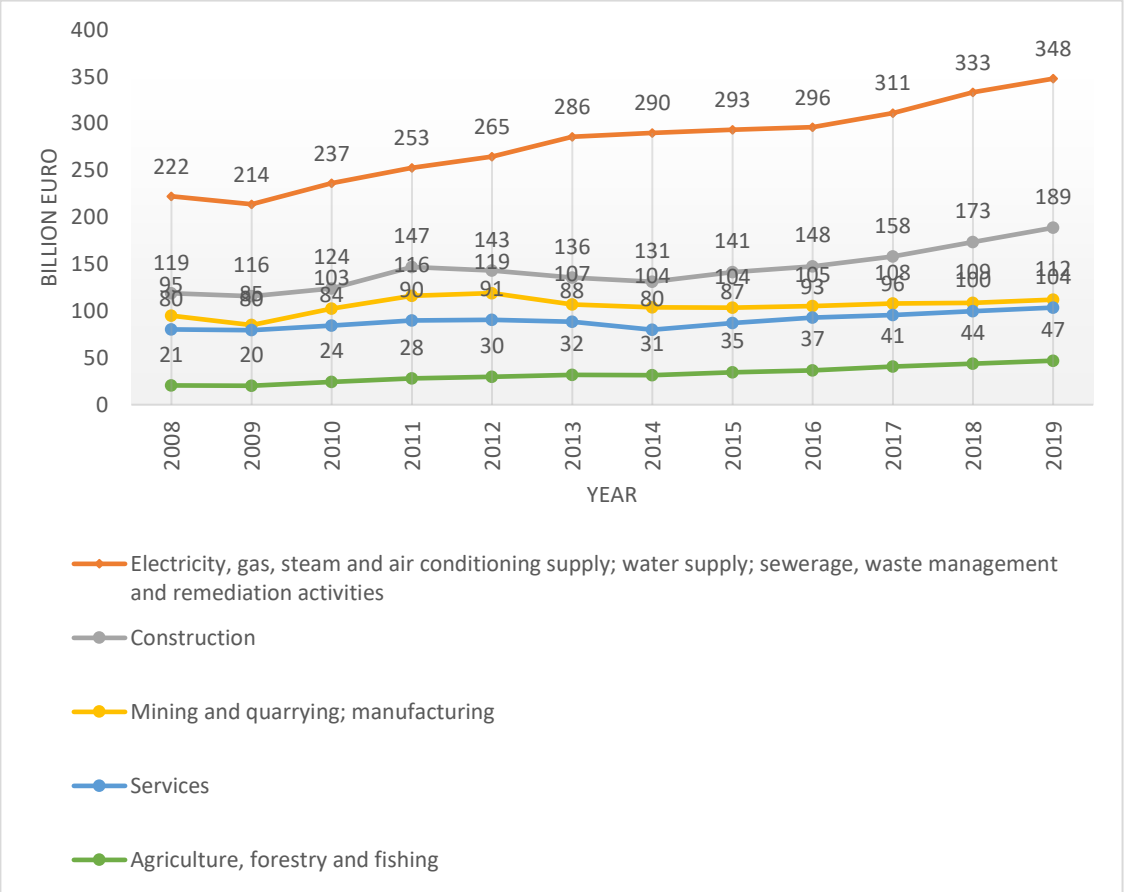

Fig. 9. Output of EGSS by industries for the EU (total 799.4 billion euro for 2019)
Source: compiled with the Eurostat data by the author

In 2020, EGS1 strongly dominates in Belgium (78.5 %) and Denmark (69.9 %), and EGS2 – in Romania (77.1 %), Luxembourg (66.4 %), Latvia (66.3 %) (the author's own calculations based on Eurostat data for countries for which "cleaner and resource efficient products" item is reported).

The size and share of EGS2 inform about the role of a country in developing the production of more sustainable products compared to analogous ones while the indicators for EGS1 reflect the industrial structure of national economy (specifics of the environmental footprint) and the aggregated efforts made by society solely for the sake of the environment.

Denmark is one of the leaders in developing both EGSS and its statistics. The sector contribution of GVA to GDP of the country is 3.36 % (source - Eurostat data). The share of specific environmental goods and services is 67 % of the turnover in 2021 (Fig. 11). Renewable energy production accounted for nearly half of the EGS turnover in 2016 (OECD, 2019, p. 149). The sector growth 1.6 times in nominal turnover since 2012 (the author's own calculations based on the StatBank Denmark) is due to the rise of production and export of renewables technology first of all. Manufacturing is the biggest producer with 59 % of the total EGS turnover (OECD, 2019, p. 149).

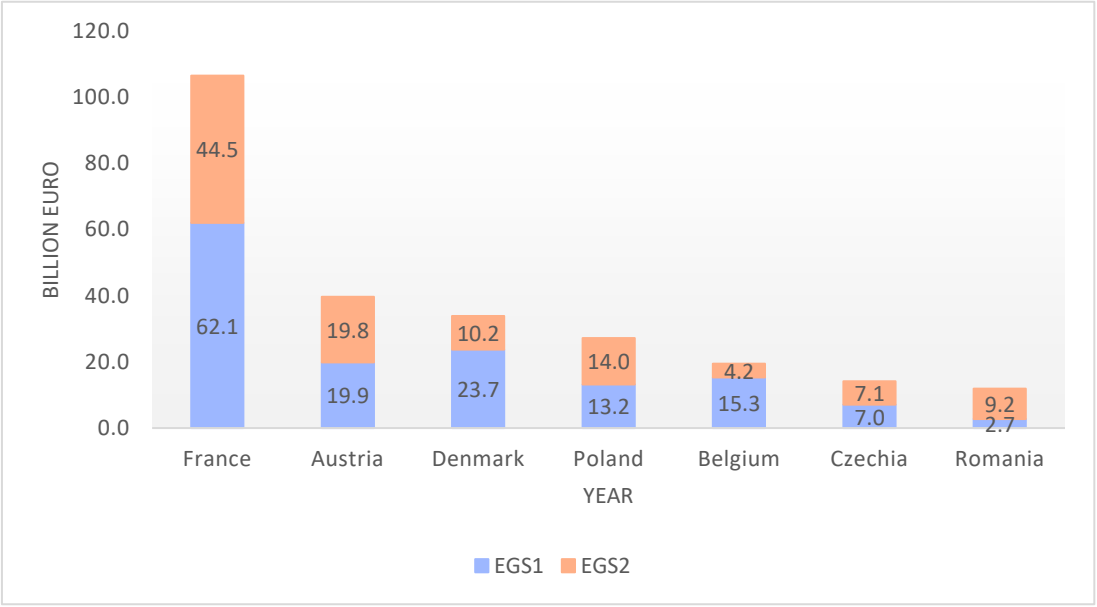

Fig. 10. Market output of EGSS by groups of products in 2020, billion euro, for selected countries

Source: compiled with the Eurostat data by the author

Fig. 11. Turnover (output of market activity) of EGSS by product groups for Denmark

Source: compiled with the StatBank Denmark data by the author

"Cleaner and resource efficient products" have higher share of value added (39 % of the turnover for this product group) than that of "Specific environmental goods and services" (25 %) (the author's own calculations based on the StatBank Denmark).

The specifics of industries producing EGS is clearly presented in Fig. 12. Renewable energy production contributes to the highest value added for section D "Cleaner and resource efficient products" while wind turbines give the highest value added of "Specific

environmental goods and services" produced by "28 Manufacture of machinery and equipment". Environmental products of "E Water supply, sewerage and waste management" are totally specific for environmental purposes (sole purpose as they "either reduce environmental pressures or help maintaining the stock of natural resources" (Eurostat, 2023)). 77 % of products (in terms of value added) of "M Knowledge-based activities" (the author's own calculations based on the StatBank Denmark data) also have sole purpose which demonstrated the industry's focus on harm prevention and efforts made to strengthen the capacity of the environment. "F Construction" demonstrates interesting changes for the period observed: share of specific environmental products started to grow in 2017 and came to 66 % in 2021 (58 % for 2012) (the author's own calculations based on the StatBank Denmark data). This is the evidence of extending the infrastructure solely produced for the sake of environmental sustainability. "Cleaner and resource efficient products" with 64 % dominate over the sole purpose environmental products in the rest of the section "C33 Manufacturing".

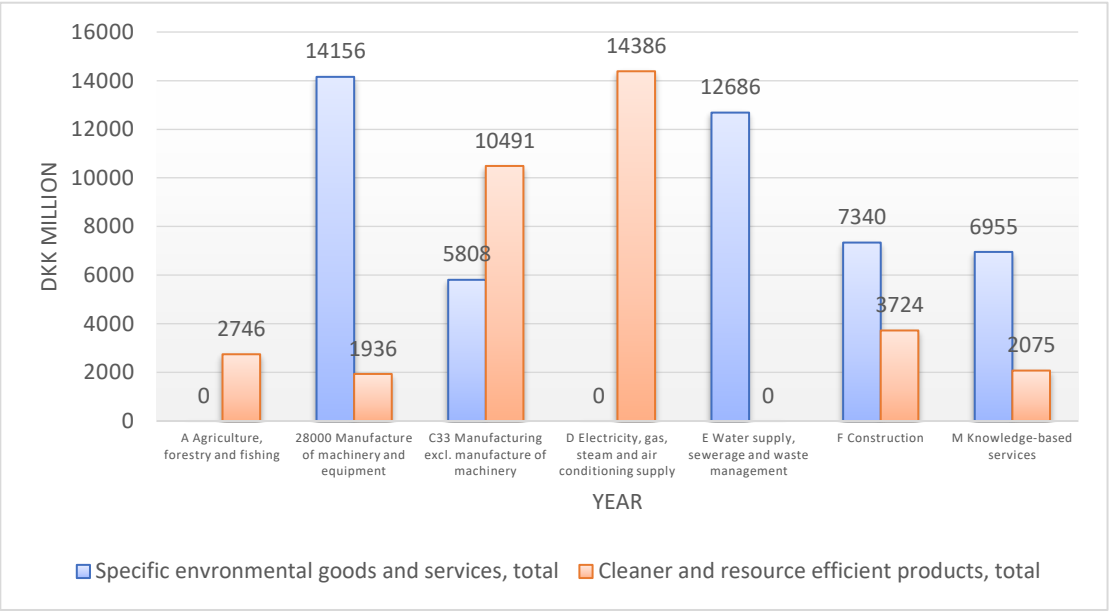

Fig. 12. Value added of EGSS of Denmark in 2021 by industries and primary purpose of products

Source: compiled with the StatBank Denmark data by the author

Austria is among the top three countries by indicator of value added of EGSS to GDP amounted to 4.21 %. Fig. 13 clearly demonstrates harm preventive character of production of environmental technologies and shift of the demand: the ratio of integrated technologies to end-of-pipe technologies was 4.35 in 2008, in 2020 – 5.06. The integrated technologies increased by 1.67 times during the period 2008-2020 while the end-of-pipe technologies – by 1.43 times only (the author's own calculations based on Statistics Austria data).

Breakdown of integrated environmental technologies by purpose reveals focus on "Management of energy resources" with 47 % of output in the domain of renewable energy and 31 % – in heat/energy saving (Fig. 14). Most of end-of-pipe technologies are produced for "Wastewater management" (33 %), "Protection of ambient air and climate" (25 %), and "Waste management" (20 %). Of these, the end-of-pipe technologies still outweigh preventive technologies for "Wastewater management" and "Waste management" domains.

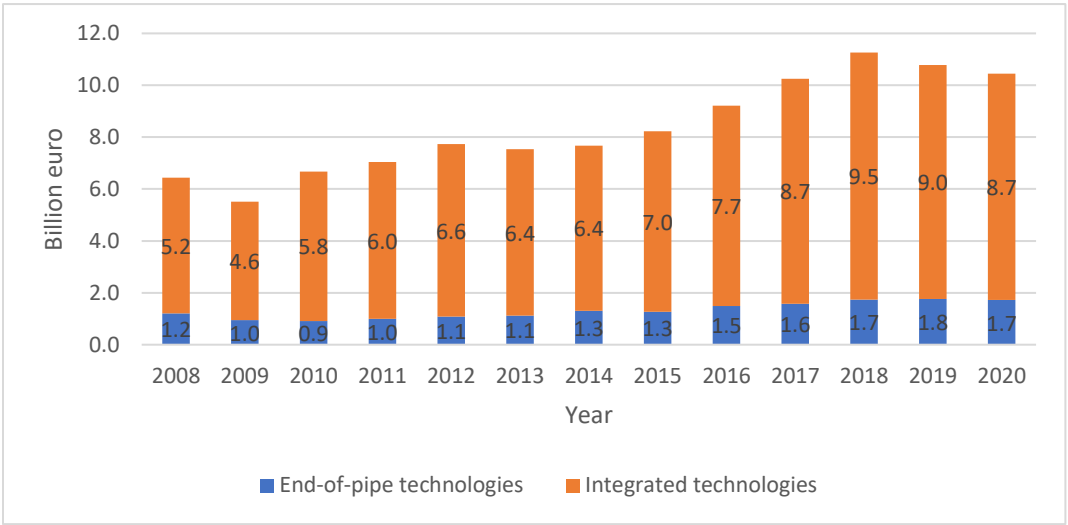

Fig. 13. Environmental technologies, market output, for Austria

Source: compiled with Statistics Austria data by the author

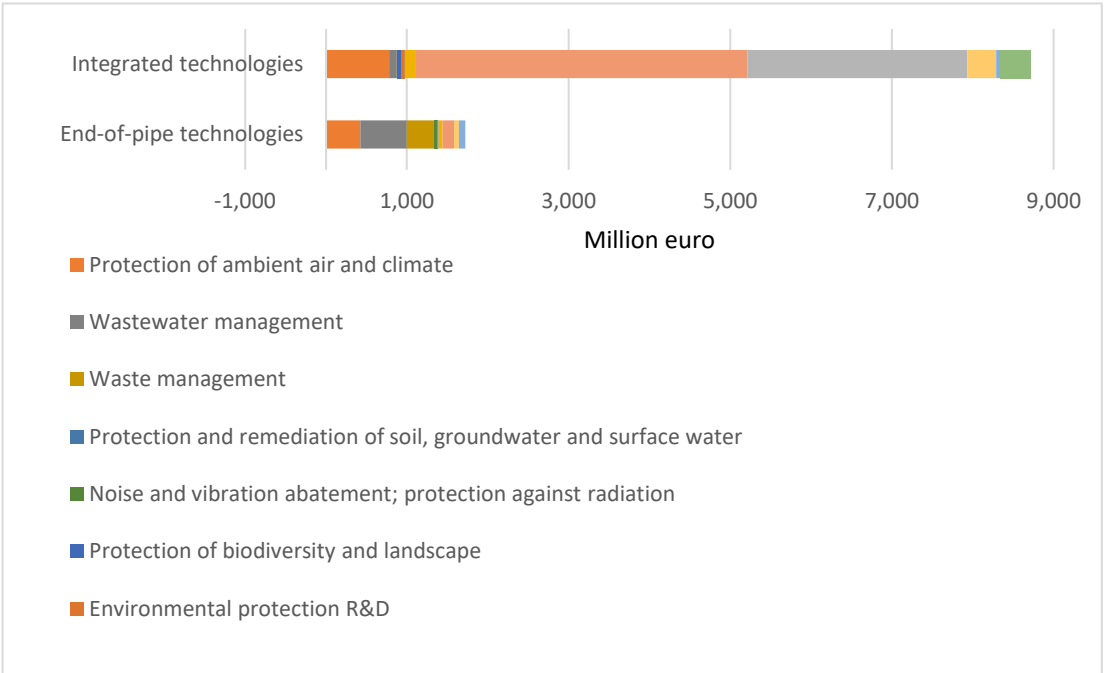

Fig. 14. Environmental technologies, market output by environmental domains for Austria in 2020

Source: compiled with Statistics Austria data by the author

6. Discussion and conclusions

The paper contributes to deeper insights into theoretical concept of environmental goods and services by integrating the visions of ecological economics, national environmental-economic accounting and marketing and proceeding with the application of green filter to the basic marketing concepts of needs and demand. The analysis presented in it provides application of P. Kotler's framework (Kotler, 1972) to types of environmental demand:

a) demand for goods and services supplied by the environment and extracted (used) either directly regardless the system of property rights to it or with the supplementary services of the economic agents;

b) demand for products of the economic production associated with the additional, secondary benefits provided together with the main benefit of a product – benefits for the environment;

c) demand for products of the economic production specially designed to serve environmental purposes/production which is driven by mandatory requirements of regulation or ethical norms. Institutions and individuals (households) need some volume/quantity of goods of the natural environment preserved (or bought like marketable permits for pollution, which can be interpreted in both cases as "produced").

The study is aimed at developing M. Polonsky's concept of "transformative power" marketing (Polonsky, 2011) in regard of environmental sustainability. Amending the efforts of F. Bontadini and F. Vona (Bontadini & Vona, 2022) in refining the list of EGS and analising the specialisation in green production, this research place the challenging theoretical concept of EGS and their production within the framework of marketing.

Empirical investigation reveals trends in the development of EGSS and groups of products which are the focus of the study in the context of its marketing facet. The study is based on the EGSS data as an aggregate of production for sustainability and proxy of market size taking into account that the available estimates of green market are quite different. One reason for this is the coverage of green products concept, which is still being debated. The statistics about EGSS is grounded on common strong methodological concepts and quality assurance even if it is not complete. It is important to monitor the sector change to link it with the improvements in the environment. Marketing has a great potential to contribute to sustainable production and consumption, but it serves as a complement to the regulations, which not only encourage green consumer choice, but are also a major driver of environmental investment.

The total EGSS output includes, inter alia, the output of market activity of economic agents. Constituting about 60 % of the total EGSS and hence being the object for marketing efforts, the market output comprises products made for the sole environmental purpose and products to satisfy non-environmental needs, but with some positive environmental impact – the greener substitutes for normal products, or sustainable products.

The potential for sustainability of green marketing as a promotion activity for goods and services based on their comparative advantages as cleaner and resource-efficient ones is rather limited because of two reasons:

a) the share of such products in the total market output of EGSS does not dominate over the sole environmental products. Here, we consider the total market output of EGSS as an aggregate indicator for preventive and mitigatory (compensatory) efforts of society corresponding to some level of quality of the environment achieved. Similar correlation is for more comprehensive total EGSS output including also non-market, own-final-use, and ancillary production of environmental goods and services;

b) the green demand is highly sensitive to main product benefit, the demand shifts to greener products providing there are evidences for cost savings while the main problem with the green products dissemination is just higher production cost. "To buy or not to buy" the additional benefits strongly depend on individual motivation of final consumers and on regulations or voluntary corporate social responsibility obligations – for business consumers.

Green marketing efforts supplemented with the conventional marketing promoting environmental specific products, the social marketing promoting sustainable use of ecosystem services and non-use values both downstream and upstream, and the socially responsible marketing promoting less environmental footprint of the organisations via the environmental investment together contribute to the environmental sustainability goals by implementing the transformative power of marketing.

The limits of the studies are conditioned to the degree of completeness and the level of details of statistics as secondary data, no primary market data were collected. Issues such as international trade and barriers to international competition in the provision of environmental goods and services as well as EGSS and innovations are not covered by the studies. The EGSS trends (with special attention to market output) were not evaluated via the benchmark of environmental footprint dynamics to measure the effectiveness of society's response. This can be offered as a future research agenda for this domain together with a deeper investigation on readiness of key industries to change their business and marketing strategies, to improve environmental performance and to increase production of EGS under the innovative EU Sustainable Product Initiative instruments (such as Digital Product Passport and organisation and product environmental footprints).

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