ANALYSIS OF THE GREEN ECONOMY IN BULGARIA

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Abstract: The concept of a green economy is an approach to achieving the goals of sustainable development of modern society. It is defined as an economy that leads to the improvement of human well-being and social equality, while significantly reducing the risks to the environment and the lack of resources. Many of the European Union's policies are related to promoting the idea of a green and resource-efficient economy, respecting the principles of the green economy. The green economy is perceived as a universal approach that has an impact on the long-term development of national economies and helps to solve a number of problems related to the economy, public welfare and environmental protection. The purpose of this report is to analyze the state of the green economy in Bulgaria. The comparison of the country's results with those of the leader in the ranking of the Green Growth Index on the individual indicators included in it, reveals the areas in which Bulgaria must make efforts to overcome the gap. The results can serve as guidelines for the future development of the country and a more successful transition to a green economy.
Keywords: Green economy, green growth, sustainable development

1. INTRODUCTION

The green economy embraces the idea of an environmentally friendly and competitive economy contributing to the sustainable development of modern society and the efficient use of natural resources[21]. The concept was developed by the United Nations Environment Program - the Green Economy Initiative, where it is defined as an economy that leads to improved human well-being and social equality[22], while significantly reducing environmental risks and environmental scarcity. A green economy is one that is low carbon, resource efficient and socially inclusive. Its income and employment growth is driven by public and private investment, which reduces carbon emissions and pollution, increases energy and resource efficiency, and prevents the loss of biodiversity and ecosystem services[23].
The term "green economy" was first introduced in a 1989 report to the UK government by a group of leading environmental economists entitled "Green Economy Plan", but in addition in the title, the report no longer contains references to the green economy. In 1991 and 1994, the authors published a sequel to the first report, entitled "Plan 2: Greening the World Economy" and "Plan 3: Measuring Sustainable Development". While the main focus of the first report is that the economy can and should come to the aid of environmental policy, the sequels extend this message to the problems of the global economy such as climate change, ozone depletion, deforestation. tropical forests and the loss of resources in developing countries around the world.

2. LITERATURE REVIEW

The term "green economy" was first mentioned in a report by a group of environmentalists entitled "Blueprint for Green Economy" from 1989. The report was prepared for the British government in order to reveal a consensus definition of the term " Sustainable Development". Nearly two decades later, in 2008, the term Green Economy was used again by the UN in the context of discussions on the political response to the global financial crisis and fears of a global recession. In October of the same year (2008), UNEP (United Nations Environment Program) launched an initiative to provide analysis and political support for investment in green sectors and greening of environmentally unfavorable sectors. As part of this initiative, a report entitled "Global Green New Deal" (GGND) was developed, published in December 2009 and proposing a combination of policy actions to stimulate economic recovery while improving the resilience of the global economy.

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Table. 1. Definitions of Green Economy

The European Environment Agency	**„It is a green economy in which policies and innovation enable society to use resources efficiently, to improve human well-being through an inclusive approach, while preserving the natural systems that sustain life on earth[24]."**
Organization for Economic Cooperation and Development	"green growth means stimulating economic growth and development, while ensuring that natural assets continue to provide the resources and environmental services on which our well-being depends. To do this, investment and innovation must be stimulated, which will lead to sustainable growth and open up new economic opportunities[25]..";
UN Development Program	"...new growth centers that can potentially contribute to economic recovery, job creation and reducing the threat of food, water, energy, ecosystem and climate crises, which have a disproportionate impact on the poor[26]."
United Nations Environment Program	"... it is the green economy that improves human well-being and social justice by significantly reducing environmental risks and environmental disadvantages. In its simplest form, the green economy can be seen as an economy that is low-carbon, resource efficient and socially inclusive. In practice, a green economy is one whose growth in income and employment is driven by public and private investment, which reduces carbon emissions and pollution, improves energy and resource efficiency, and prevents biodiversity loss and ecosystem services.[27]“
The World Bank	"... green growth - that is, growth that is efficient in the use of natural resources, minimizes pollution and environmental impact, is sustainable because it takes into account natural disasters and the role of environmental management and natural capital in their prevention. And this growth must be inclusive.”[7]

The report sees the green economy as a long-term strategy to help national economies emerge from the economic crisis, and the concept of the green economy is proposed as a policy approach to tackle the problems of slowing economic growth, job losses and continuing deterioration. of the environment and the degradation of ecosystems. The Global Green New Deal calls on governments to provide significant incentives for green sector resources by proposing the achievement of three specific objectives: 1. economic recovery; 2. eradication of poverty; and 3. reduced carbon emissions and ecosystem degradation. The report presents a framework for green incentive programs and outlines supporting domestic and international policies, including the necessary support for the least developed countries.

The green economy has become one of the pillars of major European and international strategies and can be seen as an approach leading to the achievement of structural transformation of the economy.

Definitions of "green economy" are formulated by various international organizations, presented in Table 1.The various international organizations focus on individual elements of the green economy, and their definitions collectively reflect the fulfillment of the following objectives:

- Improving the efficiency of resource use;
- Ensuring the sustainability of ecosystems, while protecting the environment and flows of eco-system services;
- Increasing social cohesion by improving people's well-being and fair burden-sharing in society.

Despite the lack of an unambiguous definition, all international organizations unite around the idea that the green economy is a "clean" economy that reduces the harmful effects of man on nature by:

- Ensuring the sustainability of ecosystems, while protecting the environment and flows of ecosystem services;
- efficient use of resources, including energy;
- conversio of waste products into a production resource;
- limited use of traditional polluting production processes;

[24] Nikolova-Alexieva V., Valeva K., (2019), “Research on the development of bio entrepreneurship in Bulgaria economic-based entrepreneurship activity in the sectors of bioeconomy“ в XXIII rd International scientific conference; Knowledge in practice, Bansko, p.13-15

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- renewable energy sources (sun, wind and water);
- energy efficiency;
- introduction of new production technologies to reduce harmful emissions into the atmosphere;
- transport that uses clean energy, biofuels and electric cars;
- social justice by improving the well-being of people and there is a fair sharing of the burden in society.

Relying on the green economy, modern society expects three types of results ensuring the implementation of global goals for sustainable development:

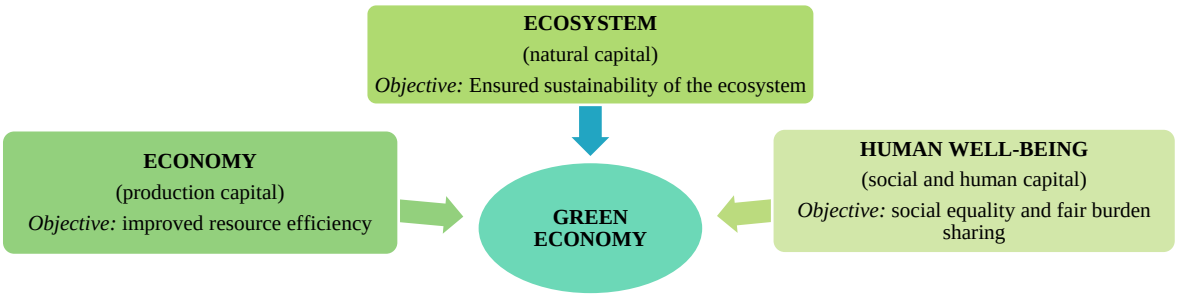
- Strong reduction of harmful emissions and pollution, reduction of resource use and reduced waste production;
- New sources of income and jobs;
- Social justice and poverty reduction.

At the operational level, the green economy is seen as an economy whose income and employment growth is driven by investments related to:

- Reduction of carbon emissions and pollution;
- improving energy and resource efficiency;
- prevention of biodiversity loss and ecosystem services;
- job creation in the green sectors.

The main elements of the green economy are presented in fig. 1

Fig. 1. Elements of the green economy



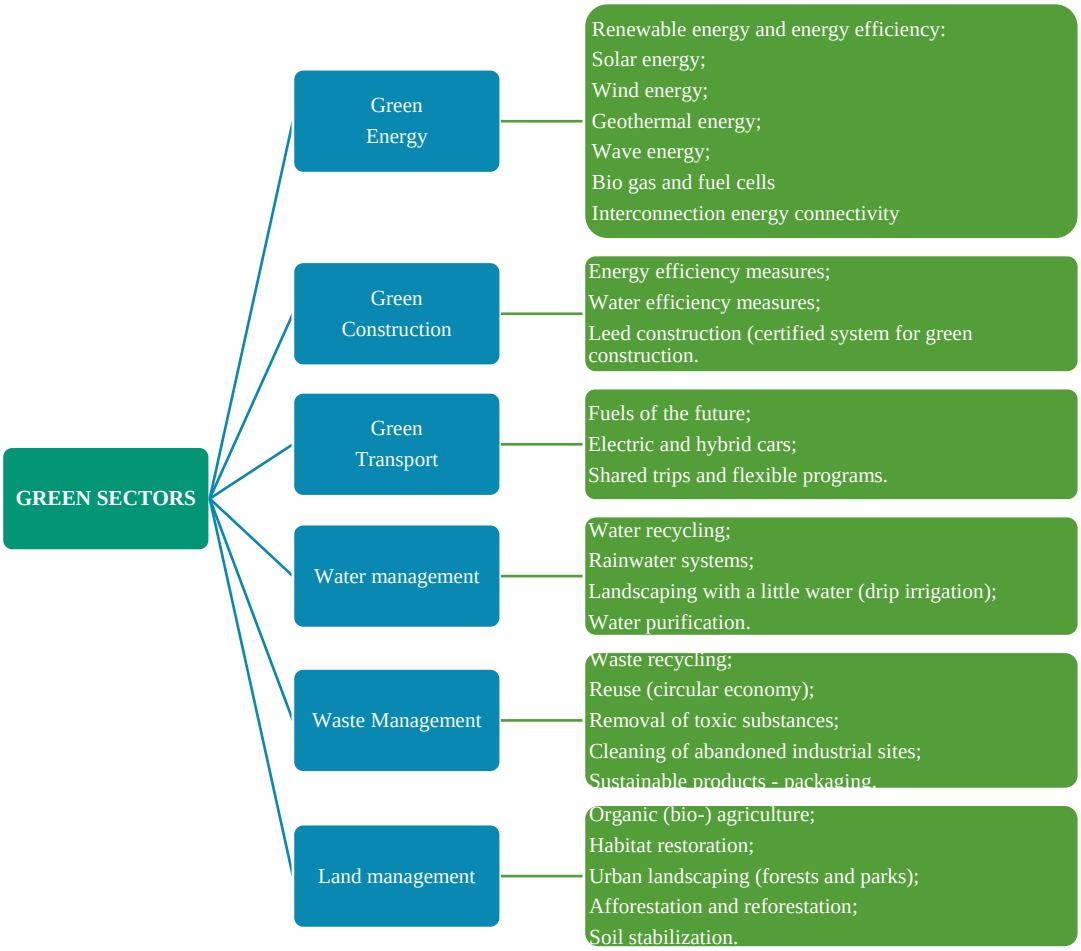
Source: European Environment Agency

The essence and understanding of the Green Economy can be summarized in the following areas:

- System of economic activities for production, distribution and consumption related to sustainability.
- A process aimed at eliminating the problems and mistakes created by the current type of economy
- A type of economy that creates human well-being and social equality while significantly reducing environmental risks and resource scarcity.
- Characterized by low-carbon economic progress, which is conducive to environmental sustainability and social development

The green economy has six main sectors to which the idea can be applied. The main sectors of the green economy are presented in fig. 2.

Fig.2. Main sectors of the green economy



These sectors are renewable energy, green buildings, sustainable transport and finally water, waste and land management. The applications of the green economy can be seen in the start-up industries of renewable energy sources such as solar, wind and geothermal energy. These renewable energies can be used to support green buildings and sustainable transport to make them more efficient and greener. Water and waste management is done through water purification and recycling. Land management in a green economy can be seen through the restoration of habitats, national parks, nature reserves and reforestation efforts.

3. RESEARCH METHODOLOGY

A conceptual model for analysis of the state of the green economy (in Bulgaria) by categories and indicators is presented in Fig.3.

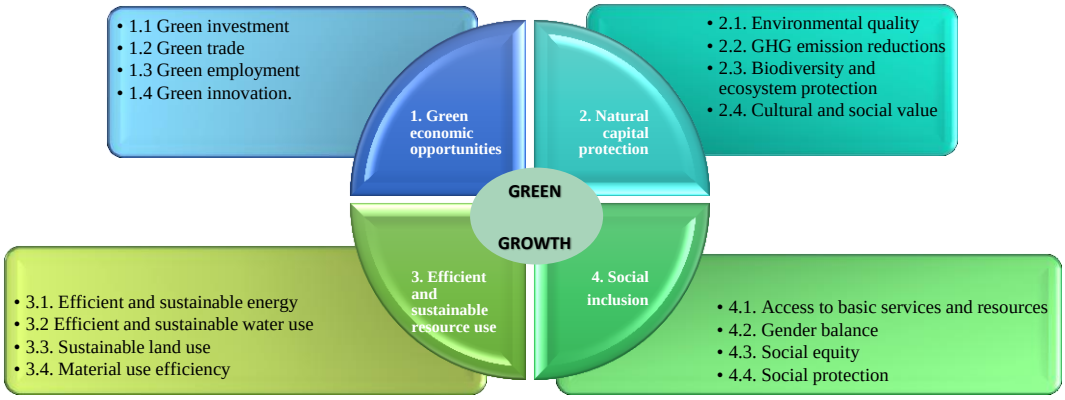


Fig.3. Conceptual model for analysis of the state of the green economy
(Adapted from Conceptual framework for the Green Growth Index)

In Table. 2 summarizes the categories for analysis, indicators, sub-indicators and their designation.

Table 2. Methods of aggregation at the indicator, indicator category, and dimension levels

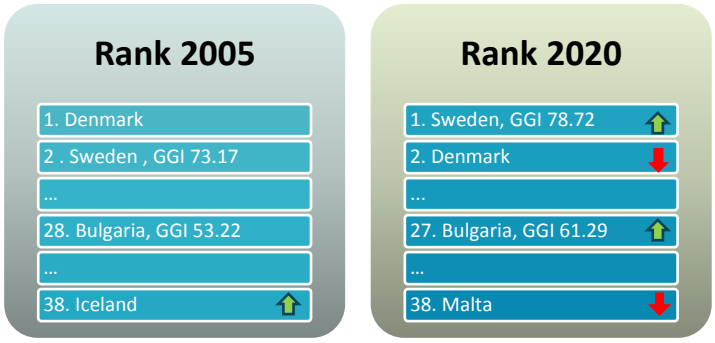
	Indicator categories	Linear aggregation of normalized indicators*	Indicator	Defining the indicator
Analysis of the state of the green economy (in Bulgaria), 2020	1. Green economic opportunities	1.1 Green investment	GV1	Adjusted net savings, including particulate emission damage
		1.2 Green trade	GT1	Share of export of environmental goods to total export
		1.3 Green employment	GJ1	Share of green employment in total manufacturing employment
		1.4 Green innovation	GN1	Share of patent publications in environmental technology to total patents
	2. Natural capital protection	2.1 Environmental quality	EQ1	PM2.5 air pollution, mean annual population-weighted exposure
			EQ2	DALY rate due to unsafe water sources
			EQ3	Municipal solid waste generation per capita
		2.2 Greenhouse gas emissions reductions	GE1	CO2 emissions to population, including AFOLU
			GE2	Non-CO2 emissions to population, excluding AFOLU
			GE3	Non-CO2 emissions in agriculture to population
		2.3 Biodiversity and ecosystem protection	BE1	Average proportion of KBAs covered byprotected areas
			BE2	Share of forest area to total land area
			BE3	Above-ground biomass stock in forest
		2.4 Cultural and social value	CV1	Red list index
			CV2	Tourism and recreation in coastal and marine areas
			CV3	Share of terrestrial and marine PA's to territorial areas
	3. Efficient and sustainable resource use	3.1 Efficient and sustainable energy	SL1	Ratio of total primary energy supply to GDP
			SL2	Share of renewable to total final energy consumption
		3.2 Efficient and sustainable water use	EW1	Water use efficiency
			EW2	Share of freshwater withdrawal to available freshwater resources
		3.3 Sustainable land use	SL1	Soil nutrient budget
			SL2	Share of organic agriculture to total agricultural land area
		3.4 Material use efficiency	ME1	Total domestic material consumption per unit of GDP
			ME2	Total material footprint per capita
	4. Social inclusion	4.1 Access to basic services and resources	AB1	Access to safely managed water and sanitation
			AB2	Access to electricity and clean fuels/technology
			AB3	Fixed Internet broadband and mobile cellular subscriptions
		4.2 Gender balance	GB1	Seats held by women in national parliaments
			GB2	Account at a financial institution or mobile-money-service
			GB3	Getting paid, covering laws and regulations for equal gender pay
		4.3 Social equity	SE1	Inequality in income based on Palma ratio
			SE2	Ratio of urban-rural access to basic services, i.e. electricity
			SE3	Youth not in education, employment, or training
		4.4 Social protection	SP1	Population above statutory pensionable age receiving a pension
			SP2	Universal health coverage service coverage index
			SP3	Proportion of urban population living in slums

(Adapted from Conceptual framework for the Green Growth Index)

4. STATE OF THE GREEN ECONOMY IN BULGARIA

According to the latest report of the Global Green Growth Institute from December 2020, tracking the development of the green economy in individual countries (180 countries around the world), Bulgaria is ranked 27th among 38 surveyed countries on the European continent. The country has improved its position compared to 2005, when it ranked 28th. During the same period, Denmark and Sweden exchanged the first two places and by 2020 Sweden is the leader of the continent. Of the 38 European countries surveyed, for the period 2005-2020, Bulgaria climbed from 28 to 27 position. (Fig. 4)

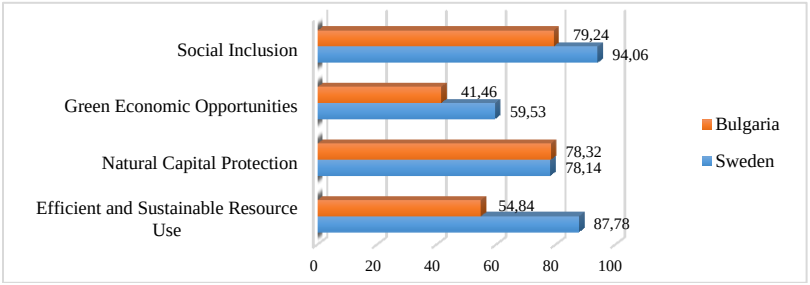
Fig. 4. GGI Rank, 2005 and 2020



Source: https://greengrowthindex.gggi.org/wp-content/uploads/2021/01/2020-Green-Growth-Index.pdf

The analysis of the state of the green economy in Bulgaria is based on the four main categories of indicators - green economic opportunities, environmental protection, efficient and sustainable use of resources and social inclusion, which are compared with the results of the leading (in the European ranking) State of Sweden. The largest convergence in the results is observed in terms of the indicator Natural capital protection, as the difference is only 0.18, and the largest discrepancy is observed in terms of Efficient and sustainable resource use. (Fig. 5)

Fig.5. Bulgaria and Sweden (№1 and № 27 in Europe for 2020)

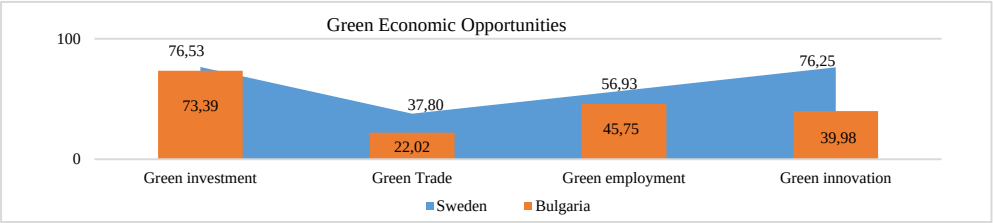


Source: https://greengrowthindex.gggi.org/wp-content/uploads/2021/01/2020-Green-Growth-Index.pdf

The decomposition of the four categories of indicators - indicators and sub-indicators and their comparison with the data for Sweden shows the following results:

- With regard to **green economic opportunities**, (Fig. 6) the values related to green investment opportunities are almost equal. (0.18) The largest discrepancy in the results is observed with regard to green innovation and green trade, with 36.27 and 15.78, respectively.

Fig. 6. Green economic opportunities (Bulgaria, Sweeden 2020)



- Regarding the indicator **protection and preservation of natural capital** (Protection and protection of the environment), the data show that in the indicator biodivercity and ecosystem protection Bulgaria shows better results than Sweden with 16.46 points. (fig.6, fig.6.1)

Fig. 6. Natural capital protection, 2020

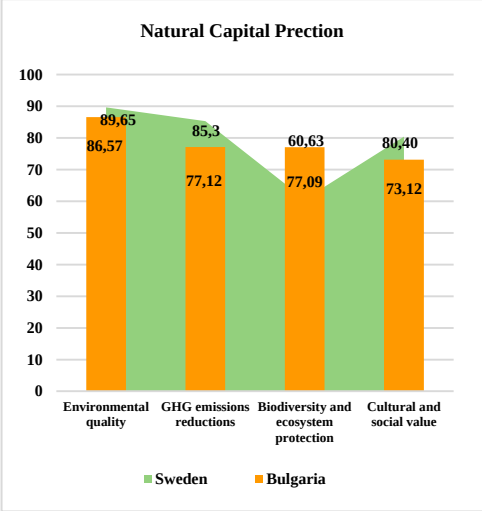
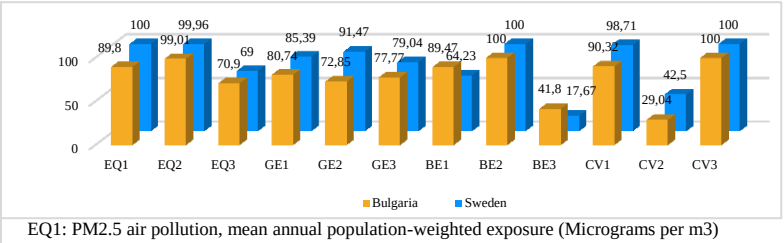


Fig. 6.1. Sub-indicators Natural capital protection, 2020



EQ1: PM2.5 air pollution, mean annual population-weighted exposure (Micrograms per m3)
EQ2: DALY rate due to unsafe water sources (DALY lost per 100,000 persons)
EQ3: Municipal solid waste (MSW) generation per capita (Ton per year per capita)
GE1: Ratio of CO2 emissions to population, excluding AFOLU (Metric tons per capita)
GE2: Ratio of non-CO2 emissions to population, excluding AFOLU (Ton per capita)
GE3: Ratio of non-CO2 emissions in agriculture to population (Gigagrams per 1000 persons)
BE1: Average proportion of Key Biodiversity Areas covered by protected areas (Percent)
BE2: Share of forest area to total land area (Percent)
BE3: Soil biodiversity, potential level of diversity living in soils (Index)
CV1: Red list index (Index)
CV2: Tourism and recreation in coastal and marine areas (Score)
CV3: Share of terrestrial and marine protected areas to total territorial areas (Percent)

- In terms of **efficient and sustainable use of resources**, the best presentation of the results in this category is related to the efficiency of the use of materials. (Fig. 7 and Fig. 7.1)

Fig. 7. Efficient and Sustainable Resource Use

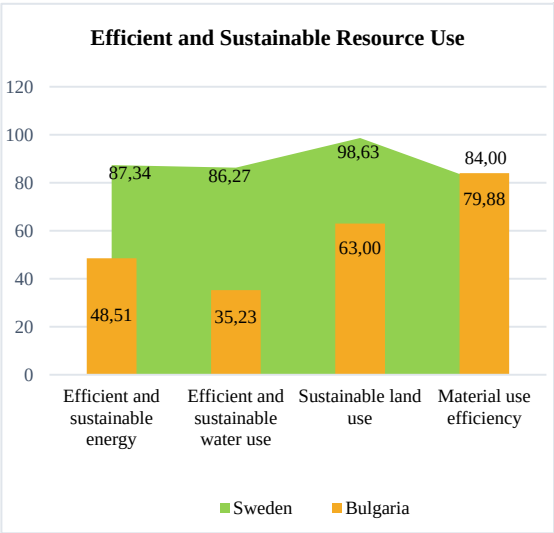
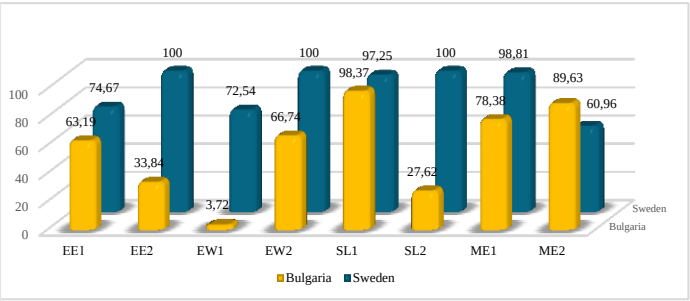


Fig. 7.1. Sub-indicators Efficient and Sustainable Resource Use



EE1: Ratio of total primary energy supply to GDP (MJ per $2011 PPP GDP)
EE2: Share of renewable to total final energy consumption (Percent)
EW1: Water use efficiency (USD per m3)
EW2: Share of freshwater withdrawal to available freshwater resources (Percent)
SL1: Average soil organic carbon content (Ton per hectare)
SL2: Share of organic agriculture to total agricultural land area (percent)
ME1: Total domestic material consumption (DMC) per unit of GDP (DMC kg per GDP)
ME2: Total material footprint (MF) per capita (MF tons per capita)

➢ Regarding the category of **social inclusion**, the data for Bulgaria show lagging behind in all four indicators.

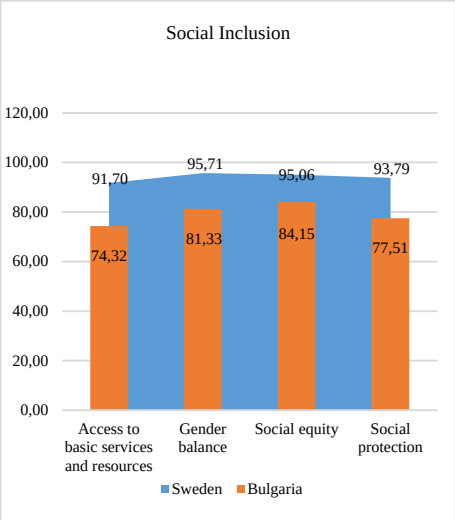
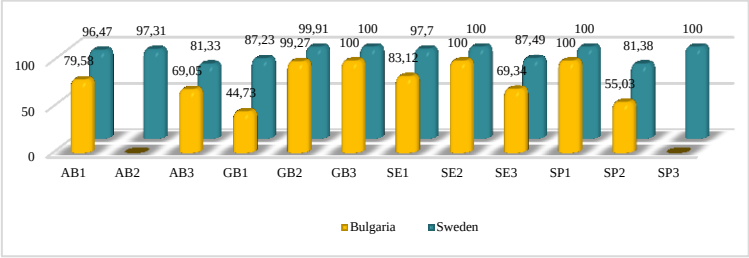


Fig. 7. Social inclusion



AB1: Population with access to safely managed water and sanitation (Percent)
AB2: Population with access to electricity and clean fuels/technology (Percent)
AB3: Fixed Internet broadband and mobile cellular subscriptions (Number per 100 people)
GB1: Proportion of seats held by women in national parliaments (Percent)
GB2: Ratio of female to male with account in financial institution, age 15+ (Percent)
GB3: Getting paid, covering laws and regulations for equal gender pay (Score)
SE1: Inequality in income based on Atkinson (Index)
SE2: Ratio of urban to rural, access to safely managed water/sanitation & electricity (Percent)
SE3: Share of youth not in education, employment or training, aged 15-24 years (Percent)
SP1: Proportion of population above statutory pensionable age receiving pension (Percent)
SP2: Healthcare access and quality index (Index)
SP3: Proportion of urban population living in slums (Percent)

Fig. 7. 1. Sub-indicators in the Social Inclusion indicator

5. CONCLUSION

It can be summarized that the concept of green economy is not just "greening" the sectors of the economy, it is a means to achieve the goals of sustainable development by: - improving human well-being, ensuring better health, education and job security place; - enhancing social justice by reducing poverty and providing conditions for social, economic and financial inclusion; - reducing the risk to the environment, taking into account climate change, the release of hazardous chemicals and pollutants, poorly managed and stored waste; - reducing environmental scarcity by providing access to fresh water, natural resources and improving soil fertility.

The comparative analysis between Bulgaria and Sweden - the country occupying the first position in the ranking of the Green Grow Index reveals the directions in which opportunities can be sought for development and transformation of the Bulgarian economy in a greener direction.

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