

EVALUATION OF THE GREEN ECONOMY IN BULGARIA

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Abstract

The green economy concept is related to the contemporary trend of searching synergy among economic, environmental and social spheres. The paper evaluates the green economy development in Bulgaria, based on a modified methodology of the global green economy index. Calculations are made of several group indicators (leadership and climate change, sectoral efficiency, markets and investments, environment and natural capital) and are compared to the best achievement in a given component. The interrelationship between the various economic components has been proven, as well as the lack of synergy in the development of the different aspects of the green economy in Bulgaria, and different policies and instruments.

ОЦЕНКА НА ЗЕЛЕНАТА ИКОНОМИКА В БЪЛГАРИЯ

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Резюме

Съвременната тенденция за търсене на синергия между икономика-околна среда-социална сфера и подходи за постигане на ниско въглеродно развитие, се отъждествяват с понятието зелена икономика. В настоящия доклад се прави оценка на развитието на зелената икономика в България на база модифицирана методология на индекса за глобална зелена икономика. Извършени са калкулации по групи индикатори (лидерство и климатични промени, секторна ефективност, пазари и инвестиции, околна среда и природен капитал) спрямо еталонно постижение в областта на зелената икономика по даден компонент, и обобщена оценка. Доказана е взаимовръзката между различните аспекти на икономиката и липсата на синергия в развитието и съответно финансирането на отделни области от зелената икономика в страната, а също и между различните политики и инструменти.

1. Green economy – dimensions and measurements

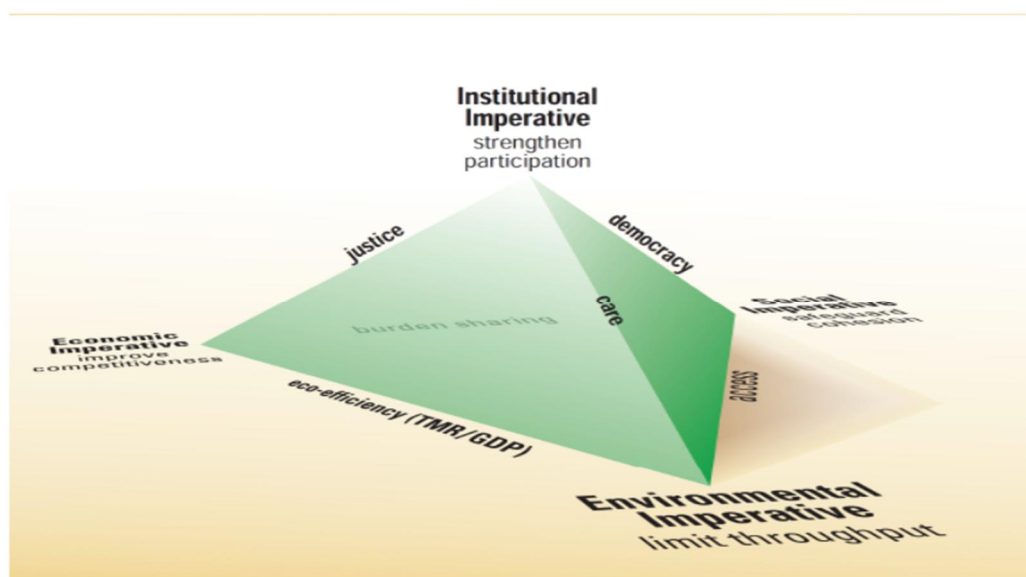
The green economy can be thought of as an alternative vision for growth and development; one that can generate growth and improve people's lives in ways consistent with sustainable

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development. UNEP (2011) Green Economy Report argues that “to be green, an economy must not only be efficient, but also fair. Fairness implies recognising global and country level equity dimensions, particularly in assuring a just transition to an economy that is low-carbon, resource efficient, and socially inclusive.”

It is often considered that a green economy promotes a triple bottom line: sustaining and advancing economic, environmental and social well-being. However, a fourth dimension is equally important. Spangenberg, 2011 analyses dimensions of sustainability – economic, environmental, social and institutional (Fig. 1) and has good reasons to underline that socio-economic and institutional (political) dimensions of sustainable development are often neglected in analyses and scenario projections. The institutional aspects are often considered in relation to integrating environmental protection in other policies, but are rarely accepted as a separate dimension. However, the institutional dimension should never be ignored when preparing a sustainable development programme. Criteria of equal worth should be developed for monitoring and evaluation of state and trends in each dimension.

Figure 1: Prism of sustainability



Four dimensions (imperatives)	Interrelations between the dimensions
Institutional imperative – strengthen participation	Justice (between dimension 1 and 2) Democracy (1 and 3)
Economic imperative – improve competitiveness	Burden sharing (2 and 3) Care (1 and 4)
Social imperative – sustain cohesion	Eco-efficiency (2 and 4)
Environmental imperative – limit throughput	Access (3 and 4)

Source: Spangenberg (2011)

There is no universal definition of “green economy”, but the concept underlines the economic dimensions of sustainability and the importance of gearing the economy in the right direction. Thus, green economy operationalizes the idea of sustainable development. The green economy concept offers a positive vision for the future in contrast to apocalyptic perspectives occurring often in the literature on ecology, see details in Turok & Borel-Saladin (2013). The vision of the authors is shared here in this paper – when progress opportunities are recognised, it is more likely to identify also a potential for development and encourage changes in citizens and policy-makers, rather than when a society is paralyzed by fear and negativism. It is possible to take measures to mitigate the degradation of natural resources and eco-systems and to improve people’s wellbeing at the same time. The focus should be on achieving benefits simultaneously and on relationships between economy and environment, but not compromising results in one dimension at the expense of another. The extent to which a real synergy, and not a compromise, is reached should be carefully analysed. A challenge is also to have “greening” of the economy, which is connected with justice and an inclusion of vulnerable groups. The understanding of different opportunities of the green economy under different conditions on a local and national level is important too. In this case problems arise when foreign regulations, models and policies are transferred without the necessary preparation and preconditions.

The interrelations between the different development aspects are very important and this could be proven by analysing correlation coefficients between indicators, related to environment, resource efficiency, production, innovations, rule of law¹, etc. (See Table 1 for calculated coefficients and Table 2 for initial data).

¹ See the text below for more details about indicators.

Table 1: Correlation coefficients for selected indicators of EU member states (2014)

Indicators		Coefficient
Gross domestic product in purchasing power standards (GDP in PPS), EU28=100,	Resource productivity (PPS /kg)	0.57
Greenhouse gas (GHG) emissions per unit GDP in PPS	Resource productivity	- 0.6
EU innovation performance (innovation scoreboard)	Resource productivity	0.44
EU innovation performance	GHG per capita	0.48
EU innovation performance	Greenhouse gas emissions per unit GDP in PPS	-0.47
EU innovation performance	GDP in PPS	0.70
Rule of law index	GDP in PPS	0.85
Rule of law index	EU innovation performance	0.87

Source: Calculated by the author based on data from Eurostat and WJP Rule of Law Index

Table 1 shows that concerning resource productivity – a weak positive correlation is observed with GDP in PPS (coefficient 0.57) and a weak negative correlation with GHG per GDP (-0.6). Countries with higher GDP are characterized by a more efficient natural resource usage and lower carbon intensity (less GHG emissions per unit of production). Between the innovation index and GDP a strong positive correlation is observed (0.7). These and other coefficients in Table 1 show that EU-member states with innovative economies are characterized by higher resource productivity, low carbon intensity and higher GDP per capita.

Table 2: Selected indicators for the EU member states

	GDP per capita in PPS		Resource productivity PPS per kilogram		Innovation index	WJP Rule of law index
	2012	2014	2014		2014	2014
EU	100	100	2.0851			
BE	120	118	2.2368	*	0.607	0.789099825
BG	46	47	0.6604		0.238	0.544505557
CZ	82	84	1.5477		0.433	0.746137194
DK	126	125	1.704		0.675	0.886825688
DE	124	126	2.0749	*	0.655	0.834612694
EE	74	76	0.7427		0.479	0.786821623
IE	131	134	1.7431	*	0.607	
EL	74	73	1.5524	*	0.399	0.599349572
ES	92	91	3.0871		0.387	0.696076181
FR	107	107	2.535		0.556	0.716796252
HR	60	59	1.7295		0.292	0.605129149
IT	101	96	3.184		0.434	0.644262982

CY	91	82	1.9361		0.487	
LV	60	64	0.8561		0.233	
LT	70	75	1.3887		0.288	
LU	258	266	3.3164		0.626	
HU	65	68	1.4695		0.364	0.568030473
MT	84	86	1.9177		0.371	
NL	132	131	3.494		0.639	0.860178213
AT	131	129	1.6014	*	0.599	0.834168467
PL	66	68	1.092		0.291	0.711870905
PT	77	78	1.4968	*	0.418	0.71100253
RO	54	55	0.7187		0.223	0.659066233
SI	81	82	1.7284		0.498	0.672771611
SK	74	77	1.6779		0.354	
FI	115	110	0.9749	*	0.658	
SE	127	123	1.462	*	0.719	0.861439623
UK	107	109	3.2991		0.580	0.808707198

Source: Eurostat, WJP

Legend: * Data for previous years

The results about the Rule of law index are very indicative of the importance of the institutional dimension of the sustainable development prism and the development of the green economy, respectively. There is a very strong positive correlation between the Rule of law indicator and GDP and innovations (coefficients 0.85 and 0.87, respectively). Therefore, EU member states with a good rule of law have also a relatively higher GDP and better innovativeness. Bulgaria has the lowest or the second lowest values in the EU concerning the above indicators.

The interrelationships are further illustrated by the summary evaluation of the green economy in Bulgaria.

The green economy concept covers various aspects, issues and aims to ensure synergy in reaching different goals. That is why, it is not possible to measure the progress by one or several indicators but it is necessary to use a set of indicators combined in indexes.

Many authors have pointed out the limitations of using GDP as an overarching measure of economic and social progress. For example, environmentalists argue that GDP is a poor measure of social progress because it does not take into account harms to the environment. A number of other measures have been developed, such as, Social Progress Index (www.socialprogressimperative.org), the Legatum Prosperity Index (www.prosperity.com), Sustainable Development Goals Index (www.sdgindex.org), Human Development Index

(<http://hdr.undp.org>). Most of the above indexes have the purpose to give adequate alternative to GDP as a universal measure of the standard of living.

Some indexes measure a certain aspect of development and are important for understanding the green economy. For example, Rule of the Law Index (World Justice Project <https://worldjusticeproject.org>) measures an important aspect of sustainable development and green economy – the institutional aspect. It could be considered as a proxy of the Institutional imperative in the prism of sustainability, because it could measure justice and democracy – the interrelations between the institutional dimension and the other dimensions in the prism (Fig. 1). The Rule of the Law Index covers the following factors: constraints on government powers, absence of corruption, open government, fundamental rights, order and security, regulatory enforcement, civil justice, criminal justice and informal justice. Examples of other indexes are E-government index, competitiveness indexes, Global Innovations index, Logistic Services Index, Human Freedom Index (www.cato.org/human-freedom-index), etc.²

A modified version of the Global Green Economy index (GGEI) is selected for a complex assessment of the green economy in Bulgaria. The reasons are the following:

- In contrast to other indexes, GGEI focuses on the green aspects of the economy and development, especially renewable energy sources (RES), low-carbon economy, and environmental protection. Financing and investments are covered by a special component of the index – Markets and investments;
- Unlike other indexes, GGEI has a special focus on innovations and clean technologies. It can also show visually the interrelations between the different aspects.

GGEI is developed by Dual Citizens Institute guided by the belief that the environment, climate change and the green low-carbon growth are becoming defining issues for national policy-makers and the global reputation of countries. GGEI has four groups of indicators which present important aspects of the green economy development and their connections: leadership and climate change, sectoral efficiency, markets and investments, environment and natural capital.

2. Evaluation of the green economy in Bulgaria

The evaluation is made by a modified methodology of GGEI. It is based on an assessment of the above mentioned four components (groups of indicators).

² Some indexes could be autocorrelated. For example, the Human Freedom Index includes the indicator Rule of Law and measures it using as a source of information the World Justice Project. The Rule of the Law Index (World Justice Project) covers fundamental rights, open government and civil society, which are included in the Human Freedom Index too.

The available information about Bulgaria is used (as of Sept. 2016), where it is possible. In cases where it is not possible to make a precise assessment, an expert assessment is made by the author of the paper. The purpose of the evaluation is to present the achievements on a given component in a comparative perspective, but not to give an exact quantitative estimate of the index or to make comparison with the GGEI of other countries. This approach for assessing the green economy in Bulgaria is chosen for the following reasons:

- Because of the limited information and resources available, it is possible to make only a pilot evaluation. For some of the indicators only an expert assessment is made. Only achievement indicators are analysed, not perception indicators.
- The evaluation is made using a three-degree scale – good, average or poor performance (score) and each indicator receives 3, 2 or 1 points respectively. Although a simple scale is chosen, it makes possible to outline and visualize strengths and weaknesses and as a result – the potential for improvement and further development of the green economy in the country. The evaluation (if an achievement on a given indicator is good, average or poor) is made by a comparison with the results of EU 28 states or the countries in Central and Eastern Europe (EU 13). When a given indicator has currently a relatively low value in Bulgaria, but some positive trends in its development could be observed over the time, this indicator receives a higher score (average or good). In contrast – when negative trends are observed, a lower overall score is given (average or poor).

Summary evaluation of indicator groups (components)³

1. Leadership and climate change

This component assesses the values and positions shared by the leadership of a country (head of state, members of parliament) and media coverage. It is considered that political leadership plays a crucial role in mainstreaming the concept of green economy. However, these indicators are rather unstable. That is why, the greenhouse gas (GHG) emissions and positions on international forums are the most important indicators in this group.

- Head of state – the European Union has long been committed to international efforts to tackle climate change. Bulgaria as an EU member supports the international agreements in United Nations Framework Convention on Climate Change (UNFCCC) and related documents. The Paris Agreement within UNFCCC was signed on 22.04.2016 by 175 countries including Bulgaria. In

³ See details in the research project Financing Green Economy in Bulgaria by Mochurova, Kotseva, Branzova, Economic Research Institute – Bulgarian Academy of Sciences (ERI-BAS), 2017

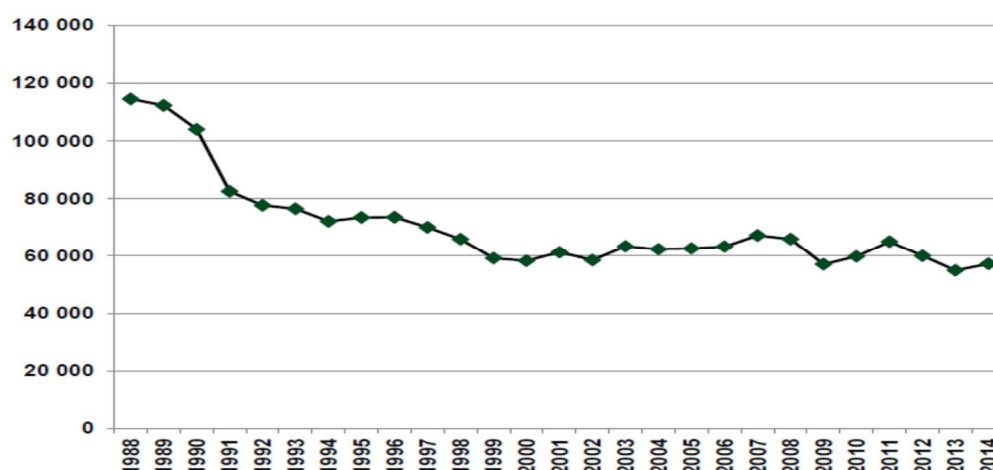
2016 the President of the Republic expressed the clear commitment of Bulgaria to mitigate climate changes for the interests of the future generations. A high score is given to this indicator.

- Media – Media in Bulgaria rarely cover climate change issues and the global actions for their mitigation, most often only during international forums or in cases of catastrophic events. A lack of constant interest in climate issues and lack of professional media reflections, with rare exceptions, could be observed. This give grounds for an average score on the indicator.

- International forums – high mark, because Bulgaria takes part in international forums and shares the EU position on climate issues.

- Climate change performance. Bulgaria has fulfilled its obligations for GHG reduction. The emissions decreased rapidly in the beginning of the 1990s. After that they stay on one level or even have slightly increased (Fig. 2).

Figure 2: Total GHG emissions (without LULUCF) for 1988 – 2014, Gg CO₂ eq.



Source: EEA, GHG inventories

The emission reduction is a result mainly of the economic restructuring in the country and the transition to a market economy, but not a result of a purposeful policy. This justifies the average score on this indicator.

The maximum score on this component is 12 points, and Bulgaria scores 10 points or 83% of the standard (the best performance score).

2. Sectoral efficiency

It is an important component of assessment because high energy and resource intensities lead to higher production costs and a lack of competitive advantages of the economy. Energy savings is a measure with a good degree of readiness for implementation and a sure way for achieving the Europe 2020 goals. This component includes the following indicators:

- Buildings

A significant number of home buildings in Bulgaria need measures for improving of energy efficiency. The biggest issue are the so called panel blocks, which are 18 900, and above 1.77 million people live in them. Panel homes are about 50% of all homes in some big towns. Analyses show that energy characteristic of public infrastructure (administrative buildings) are extremely bad too.

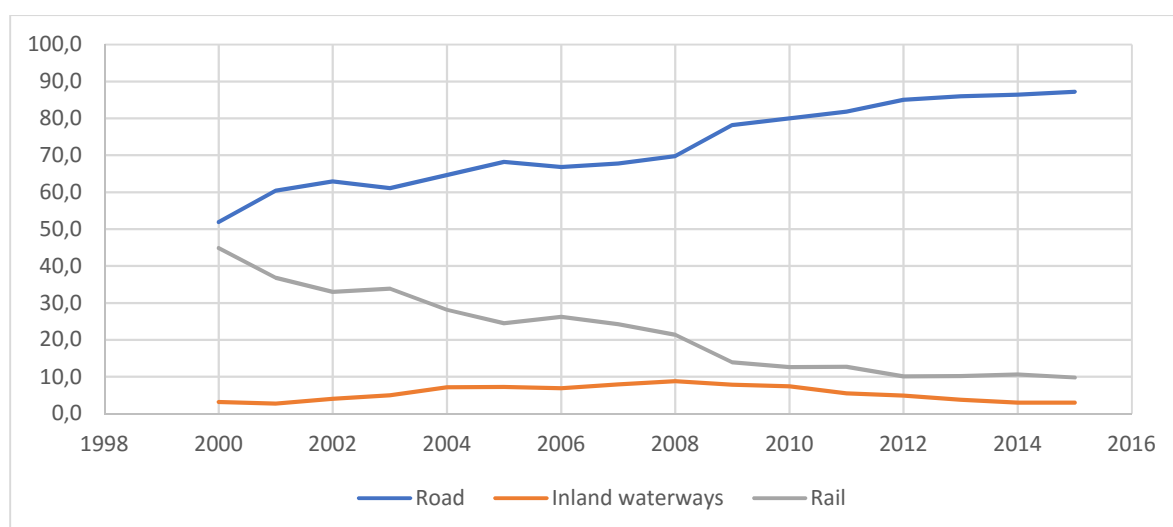
There are annual plans for applying energy efficiency measures in public buildings. As an EU member Bulgaria has transposed the Energy Efficiency Directive concerning design and construction standards. Till 2020 all new public buildings should meet the requirements for near zero-energy buildings. Therefore, an improvement in the situation could be expected and an average score is given to this indicator.

- Transport

Road transport is less energy-efficient and produces more emissions per kilometre than rail and inland waterways transport. Therefore, the use of vehicles for freight transport has greater social and environmental impact, such as pollution, global warming, road accidents, etc.

For the period 2000 - 2015 the average annual growth rate of carriages by road transport was 11.4%, of inland waterway transport – 6.9%, while for railway transport a 2.7% decrease was recorded. During the period 2000 - 2015 an unfavourable trend of increasing the share of road transport was observed and its percentage for 2015 was 87.2% from the total performed work, measured in tonne-kilometres (Fig. 3)

Figure 3: Modal split of freight transport



Source: National Statistical Institute (NSI)

Another problem is that above 85% of all 4.1 million vehicles in the country are 10-year old, 43% are 20-year old. The following reasons give ground to put a poor score to this indicator: the significant share old passenger cars which cause serious air pollution, the domination of road public transport instead of rail transport and the abating role of the passenger and freight rail transport, which contradicts the modern trends for increasing the role of railways.

- Energy

On the one hand, energy sector is developing under turbulent conditions – conflicts among different stakeholders, frequent changes in the legal framework and institutions, changes in the strategic orientation. The energy regulatory body functions ineffectively. Losses along the energy transfer system are relatively high; the objectives for energy savings are not met on time. On the other hand, there are positive results – Bulgaria met its obligation for the share of renewable energy sources (RES) in the final energy consumption in advance in 2012, import dependence is low. Positive changes are expected in the course of the implementation of EU legislation – therefore, an average score could be given on this indicator.

- Tourism is an important sector for the Bulgarian economy – according to NSI the sector contributes directly and indirectly for above 16% of GDP. However, the touristic product is dominated by the mass tourism (sea and mountain) and the tourism expansion has some negative impacts – low efficiency, overbuilding in seaside and mountain resorts. The tourist flow is highly concentrated – 70% of activities are located on 5% of the territory of Bulgaria. The National strategy for the sustainable development of tourism stipulates the share of the specialized types of tourism to be increased and also encourages the development of new touristic products (cultural, spa and wellness, eco and rural, congress, adventure tourism, etc.). Thus, positive development could be expected in the future and an average score may be put to this indicator.

In conclusion, on Sectoral efficiency component Bulgaria receives 7 points out of 12 points or 58% of the best possible performance (the standard).

3. Markets and investments

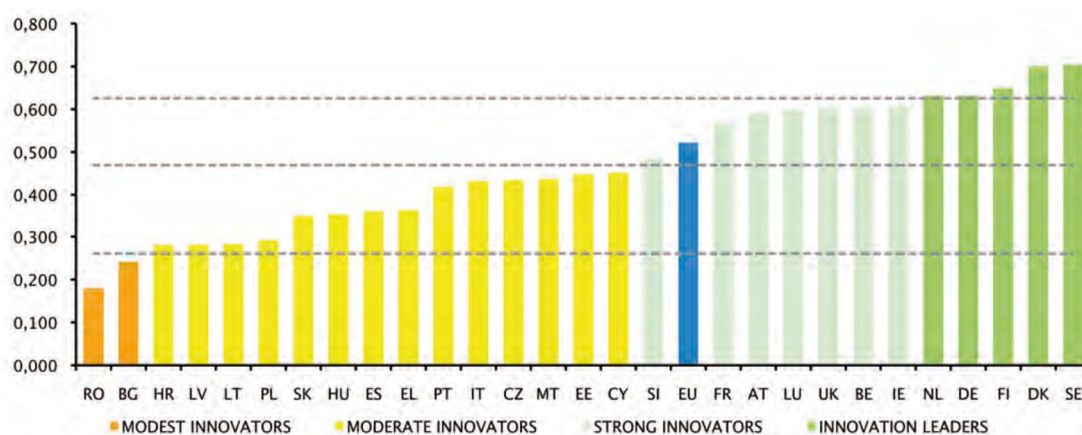
- Investments in RES

As a result of investment flows in the country, there are significant green assets at the end of 2012. Assets have increased by BGN 2.5 billion or 120% as compared to the previous year. Since 2013 investments have been declining, and assets declined too. It is justified to give a high score on this indicator.

- Innovations and clean technologies

Bulgaria is on next to the last place in the rating of the European Innovation Index (Fig. 4). The country lags behind the average European level on all quantitative scores of innovation performance.

Figure 4: European innovation index



Source: EU, European Innovation Scoreboard, 2016,

<http://ec.europa.eu/DocsRoom/documents/17822>

According to the Eurostat database sectors related to energy and environment report zero business expenditures for research and development (R&D) activities. Thus, the total investments in RES are relatively high but out of them no funds have been allocated to R&D activities. A number of documents conclude that the connections between science, innovations and the business are poor; innovativeness of the Bulgarian small- and medium-size enterprises is low. The share of R&D expenditures in the GDP is low too. The above arguments justify putting a poor score on this indicator as a whole and in the context of the green economy evaluation.

- Cleantech commercialization – because of the low innovativeness of the economy – poor score too.
- Green investment facilitation

Main instruments for facilitation of green energy are the preferential prices for the purchase of electricity from renewable energy sources and the long term contracts, which made the sector attractive for investments. However, the lack of stability in the regulatory framework is a major weakness, which should be overcome in the future. There are problems with regulations, asymmetry of information, favouring of certain producers and lack of support for decentralized electricity production. There is no purposeful policy for encouragement of green investment (with

the exception of RES till 2013, which however have caused some negative effects and imbalances in the energy sector and the economy as a whole). These arguments give reason to put a poor mark on this indicator.

Therefore, concerning the third component Bulgaria scores only 6 points or 50% of the best performance in this field of the green economy.

4. Environment and natural capital

- Agriculture

This indicator assesses policies concerning effects from intensive agriculture, including subsidies and pesticides. Significant funds from the EU have been invested in Bulgarian agriculture but the effects are debatable (Boyukliev, 2016). The subsidies have stimulated large-scale farms and monoculture agriculture. On the other hand, some positive trends could be observed – improvements in the ecological quality of soils, increase in the arable land, increase in the share of organic farming, etc. These give reasons to put an average score on this indicator.

- Other components of the environment

Analyses based on state of environment reports, published by the Environmental Executive Agency and other data give grounds to put the following marks⁴:

Air quality – poor score

Water – high score

Biodiversity – high score

Fisheries – average score

Forests – average score

The total score of the fourth component Environment and natural capital is 13 points out of maximum 18 points or 72% of the best performance score. This is a relatively high score. The overall positive assessment on this component deduced by the author corresponds to a certain extent to the environmental performance index of Bulgaria, calculated by the Yale University⁵. In 2016 Bulgaria takes 33th place out of 180 countries with a relatively high score (83.4 out of 100 points).

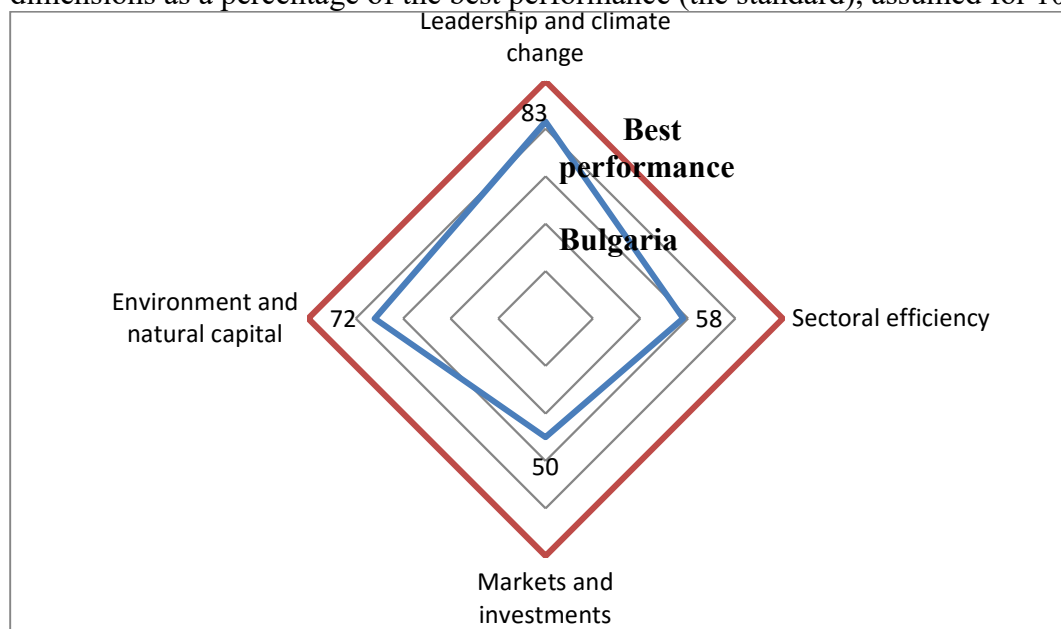
⁴ See details in Mochurova, Kotseva, Branzova (2017), Financing Green Economy in Bulgaria, research project, Economic Research Institute – BAS, 2017

⁵ <http://epi.yale.edu/>

3. Summary evaluation and conclusions

The summary evaluation is presented in Fig. 5.

Figure 5: Evaluation of the green economy in Bulgaria based on a modified GGEI (by four dimensions as a percentage of the best performance (the standard), assumed for 100%)



Source: Author's calculations

The figure shows that Bulgaria performs relatively well on the first and fourth component of the green economy (Leadership and climate change and Environment and natural capital). Results are relatively poor in Sectoral efficiency and Markets and investments. Improvements are specially needed in the following aspects:

- Sectoral efficiency – more precisely sectors Buildings and Transport;
 - Markets and investments – measures for encouraging innovations and clean technologies and facilitation of green investments.

Positive results are mainly due to projects financed by the EU funds and implemented within the framework of certain EU regulation. The sustainable development concept is “imported” from abroad and transferred automatically into national strategic documents without ensuring a coherence of the “green” aims. A strategy for a green development and growth is lacking in Bulgaria and thus, projects have been implemented inconsistently. There is no synergy between different policies and instruments.

The symmetric figure Best performance (the standard) shows the perfect theoretical relationships between the different aspects of the economy. The irregular figure derived for Bulgaria (Fig. 5) illustrates visually the lack of synergy in the development of the various aspects

of the green economy. For example, the reduction in GHG (component 1) and investments in cleaning technologies have been imbalanced and have not led to stimulations of innovations and new technologies and improved attractiveness of the Bulgarian market for new green investments (component 3). The increased share of RES in the final energy consumption (component 3) has not led to better air quality (component 4). The low efficiency of sectors is alarming, especially the need to improve energy efficiency of buildings, eco transport, incl. railways (component 2) and to lower the carbon intensity of economy as a whole (component 1).

The analysis has proven that the assessment of the green economy development is a complex interdisciplinary issue and sets of indicators should be used. Green economy has different aspects and dimensions and it is important to study the interrelations among them.

BIBLIOGRAPHY

Boyukliev, O. (2016). Agricultural sector as a factor for economic development of Bulgaria. In: Beleva, I., M. Dimitrov (eds.) *Annual Report 2016: Economic Development and Policies in Bulgaria: Evaluations and Prospects*, Economic Research Institute – BAS, Sofia: Gorex Press, https://www.iki.bas.bg/files/Doklad_2016_EN.pdf, p. 133 - 152

Dual Citizen, 2014, The Global Green Economy Index GGEI 2014, Measuring National Performance in the Green Economy, 4th Edition – October 2014, <http://dualcitizeninc.com/GGEI-Report2014.pdf>

EC, European Commission, 2016. European Innovation Scoreboard, 2016

EC, 2016, Member States Renewable Energy Progress Reports. Available at: <http://ec.europa.eu/energy/en/topics/renewable-energy/progress-reports> [visited 2016.08.24]

European Environment Agency (EEA), 2015, SOER - The European environment — state and outlook 2015

Eurostat, June 2016, Energy datasheets: EU-28 countries

Ministry of Environment and Water, Environmental Executive Agency, National Report on the Status and Protection of the Environment in the Republic of Bulgaria, <http://eea.government.bg/bg/soer/2014>

Mochurova, M., M. Kotseva, P. Braznzova, 2017, Financing Green Economy in Bulgaria, research project, Economic Research Institute - BAS

Spangenberg, J.H., 2011, Sustainability beyond environmentalism: the missing dimensions, <http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.201.2770&rep=rep1&type=pdf>

Turok & Borel-Saladin, 2013, Promises and pitfalls of the green economy. In: *ISSC/UNESCO (2013). World Social Science Report 2013: Changing Global Environments*, OECD Publishing and UNESCO Publishing, Paris, p. 289–294

UNEP, 2011, Towards a Green Economy: Pathways to Sustainable Development and Poverty Eradication, www.unep.org/greeneconomy ISBN: 978-92-807-3143-9