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Roman ZVARYCH,
D.Sc. (Economics), Professor, Head of International
Economic Relations Department,
West Ukrainian National University,
11 Lvivska st., Ternopil, Ukraine, 46009,
e-mail: romazvarych@yahoo.com
ORCID ID: 0000-0003-3741-2642

Olha MASNA,
PhD student of International Economic Relations Department,
West Ukrainian National University,
11 Lvivska st., Ternopil, Ukraine, 46009,
e-mail: m_a_c_n_a_o_l_i_a@ukr.net
ORCID ID: 0000-0003-2592-5619

Igor RIVILIS,
Executive Vice President, Chief Operating Officer,
M3 Technology, LLC, Matawan, New Jersey, USA.
PhD student of International Economic Relations Department,
West Ukrainian National University,
11 Lvivska st., Ternopil, Ukraine, 46009,
e-mail: igor@rivilis.com
ORCID ID: 0000-0003-3764-2843

METHODOLOGICAL PRINCIPLES OF THE FORMATION THE CONCEPT OF GREEN ECONOMY

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Abstract

Introduction. *A "green economy" is an economy that aims to reduce environmental risks and environmental deficits, and that aims at sustainable development without environmental degradation. It is closely related to environmental economics, but has a more politically applied orientation. A green economy is socially inclusive, produces very*

little carbon and is resource efficient. In this aspect, the problem of forming new ways of development for the restoration of the natural environment, while ensuring a decent standard of living for people, becomes particularly important. Among the important results of such searches are the concept of "green economy" and indicators of "green economy", their adaptation to the real conditions of the country and regions.

***The purpose of the article** is to research and analyze the methodological foundations of the formation of the concept of green economy, its main principles and indicators.*

***Methods.** The methodological basis of the research is theoretical generalization and comparison, analysis and synthesis, carrying out scientific knowledge in order to define the concept of "green economy" and the concept of "green economy". The statistical and factual basis of the study is the official data of the statistical organization of the European Commission - Eurostat.*

***Conclusions and prospects of further research.** The concept of "green economy" is defined, which is based on minimizing the impact on the environment, social justice, ensuring a high level of well-being. The concept of "green economy" has gained special importance in recent years. The goal of the "green economy" is the formation of an effective environment for economic and social progress, based on minimizing the negative impact on the environment and effective use of natural resources while maintaining a decent population balance; reducing waste or ensuring its proper disposal is an important part of the ongoing process of economic development to protect lives and livelihoods and transition to a vibrant green and sustainable economy.*

Prospects for further research consists in applying the principles and concept of "green economy" for the transition and development of the domestic "green economy".

***Keywords:** "green economy"; environmental protection environment; sustainable development..*

Formulas: 0, fig: 5, tab: 1, bibl.: 12.

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Introduction. Sustainable development is understood as development that allows for a long-term basis to ensure a stable economic growth that does not lead to degrading changes in nature and allows us to count on the satisfaction of the needs of both today's and future generations, without rejecting the theses about the real limitations of the resource-natural potential of the biosphere. The concept of sustainable development became the theoretical basis of human development for the next two decades.

Many countries today are implementing sustainable development and "Green economy" strategies. However, methodological approaches to their indicators differ significantly in different countries of the world. Usually, there are different approaches to the formation of indicators of social progress in European countries, North American countries, countries of the Asia-Pacific region, and countries of the post-Soviet space.

Despite the use of different approaches to the formation of different groups of indicators, these systems are aimed at studying the evolution of the natural capital of countries and its relationship with the economy and society in a general format.

The problem statement. Today, the problem of forming indicators of the "Green economy" and their adaptation to the real conditions of the country and regions remains particularly relevant.

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Recognizing that countries are at different levels, they are offered a minimum list of basic indicators and types of indicator systems, based on national priorities and development goals, and additionally develop their own sets of indicators to test and prepare national programs, taking into account the satisfaction of regional and national needs of each country.

Research results. Over the past three decades, humanity has made significant progress in improving material life. But this progress came at the cost of deterioration of the planet's natural environment. Continuation of economic development without radical changes in existing economic models will lead to an increase in environmental threats and will make sustainable development impossible. With this in mind, economists, sociologists, politicians, representatives of natural sciences and the business community began to look for new ways of development to restore the natural environment, while ensuring a decent standard of living for people. One of the results of such searches is the concept of "green economy", which has gained considerable popularity thanks to the support of international organizations and national governments.

The term "Green economy" was first coined in 1989 in a report prepared for the UK government by a group of environmental economists as part of a consultation on sustainable development and its measurement. In 1990 and 1994, the same author published Program 2: Greening the World Economy and Program 3: Developing Extinction as a follow-up to the above report. Over the past 5 years, the view of these scientists on the development of the world has improved significantly: if the main idea of the first report was to help the economy in the implementation of environmental policy, then the next one is focused on global environmental problems (climate change, ozone layer), depletion, destruction of tropical forests, loss of natural resources in developing countries) and the need to modify traditional models of economic development. In 1992, the "Agenda for the XXI century" was adopted at the UN Conference on Environment and Development held in Rio de Janeiro.

In 2008, the term "Green economy" was actively used in the context of the discussion of anti-crisis policy: in the context of the financial crisis and the threat of a global recession, the OECD advocated the idea of "green" stimulation, primarily in those industries where large-scale state investments can give impetus to the formation

basics of the "Green economy" [1]. This has inspired a number of national governments to introduce packages green incentives as part of economic recovery measures and three goals are set: economic recovery, poverty eradication, reduction of carbon emissions and prevention of ecosystem degradation.

A significant part of the well-known definitions connects the "greenness" of the economy with social justice, reducing the negative impact on the surrounding natural environment, and increasing the efficiency of natural resource use.

The term "Green economy" is not consistently defined as it is still an emerging concept. The most widely used and authoritative green economy definition comes from UNEP.

[A] green economy [is] one that results in improved human well-being and social equity, while significantly reducing environmental risks and ecological scarcities [2].

At the same time, emphasis is placed on low-carbon development and effective use of natural resources, taking into account existing social factors. In a "green" economy, according to UNEP, income and employment growth should be ensured by public and

private investments that lead to a reduction in carbon emissions and environmental pollution, increase the efficiency of resource use, prevent the loss of biodiversity and contribute to the expansion of ecosystem services [3].

UN DESA notes: A “Green economy” is an economy that leads to improved human well-being and reduced inequality, while not exposing future generations to significant environmental risks and environmental deficits. It seeks to bring long-term social benefits to short-term measures aimed at mitigating environmental risks. “Green economy” is a favorable component of the overall goal of sustainable development [4].

The International Chamber of Commerce considers a “Green economy” as one where economic growth and environmental responsibility complement each other, supporting progress in social development [5].

The given definitions are about minimizing the impact on the environment, social justice, ensuring a high level of well-being.

The theory of “Green economy” is based on three axioms (see fig.1):

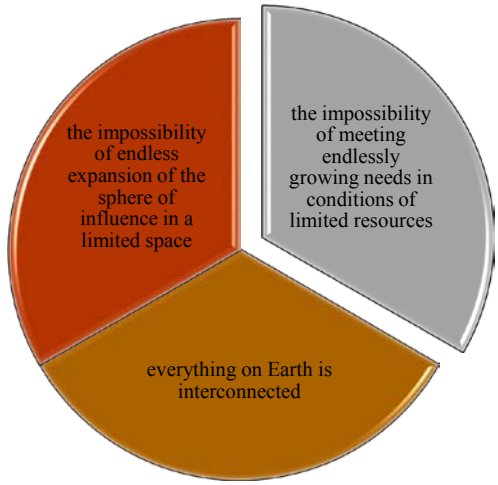

Fig. 1. Axioms of the theory of “green economy”

Source: authors according to [6].

Green economy theories cover a wide range of ideas that relate to the relationship between people and the environment. Green economists argue that the basis for all economic decisions must be related to the ecosystem in some way and that natural capital and environmental services have economic value.

The green economy can also be viewed of principles, aims and actions, which generally include: equity and fairness, both within and between generations; consistency with the principles of sustainable development; a precautionary approach to social and environmental impacts; an appreciation of natural and social capital, through, for example, the internalisation of external costs, green accounting, whole-life costing and improved governance; sustainable and efficient resource use, consumption and production; a need to fit with existing macroeconomic goals, through the creation of green jobs, poverty eradication, increased competitiveness and growth in key sectors.

The goal of the “Green economy” is the formation of an effective one an environment for economic and social progress based on minimizing the negative impact on the

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environment and effective use of natural resources while maintaining a decent population balance.

This goal is implemented through sub-goals, which include:

- protection, preservation, reproduction of natural resources and prevention of irreversible loss of biodiversity by minimizing the negative anthropogenic impact on the environment, preservation and reproduction of green spaces, ensuring the integrity of ecosystems, improving the quality of natural resources, etc.;

- increasing resource efficiency (increasing the productivity of natural resources involved in the economic cycle and reducing the amount of waste thanks to the implementation of a closed production cycle and maximally complete disposal of waste), with a reorientation towards the predominant use of renewable resources;

- economic development based on structural changes leading to an increase in the importance of “green” sectors with a corresponding reduction in “brown” ones;

- ensuring social progress in the “green” segment of the economy - creating “green” jobs, increasing the income of the population, obtained due to employment in the “green” sector of the economy, improving the quality of goods and services due to the arrival of “green” products on the market, etc [7].

The named goals are closely interconnected, because the implementation of one of them ensures progress in relation to the others. The goals of the “Green economy” are in organic unity and ensure the achievement of a common goal.

The “Green economy” is formed taking into account a certain system of principles, which are also interpreted differently by researchers, international organizations, and national documents.

The concept of “Green economy” is based on the principles that determine the actions of businesses, governments, and communities. Their content reveals the essential difference between this model of economic development and others (see fig. 2).

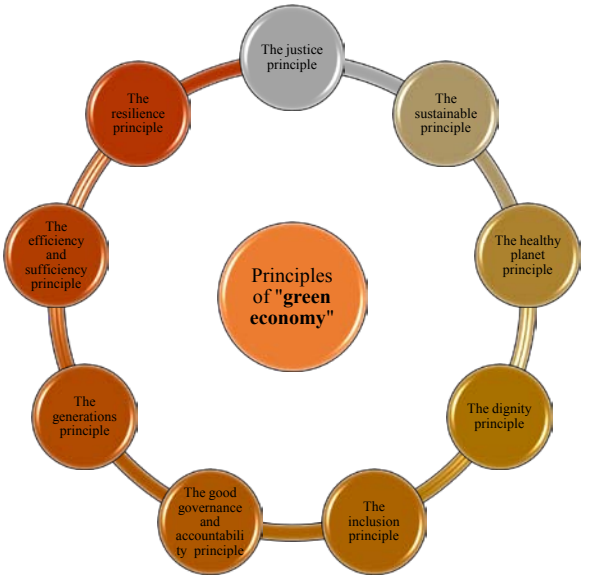

Fig. 2. Principles of the “green economy”

Source: authors according to [8].

The first principle is the justice principle. “Green economy” ensures equality between countries and within countries, as well as equality across generations, recognizing human rights to preserve the conditions of one’s own life. The Green Economy promotes gender equality and cultural diversity by recognizing the rights of indigenous peoples to their land, territories and resources. The second is the sustainable principle was that the “Green economy” is seen as one of those people that ensures the achievement of sustainable development, but does not replace it. According to this, the “Green economy” contains all three components of sustainable development, namely: environmental, social and economic) and provides for the development of balanced policies aimed at achieving the best results for each of these three components. The next is the healthy planet principle is interpreted in detail and contains six general points, namely “Green Economy”:

- recognizes its dependence on ecosystem productivity and biodiversity
- does not violate ecological boundaries and ensures rational and efficient use of natural resources
- applies the precautionary principle
- assesses the impact of new technologies and innovations before they are implemented
- evaluates the impact of economic policy on the environment and strives to find the least destructive and acceptable model of transformations for the environment and people
- contributes to the restoration of balance in ecological and social relations.

The dignity principle is based on the fact that the “Green economy” reduces the scale of poverty. “Green economy” ensures a high level of human development, food security and access to basic services. It changes traditional jobs and creates new “green jobs”. “Green economy” supports the right to development and improves the quality of life of the population. The inclusion principle outlines the formation of mutual relations in society, which should be formed on the basis of transparency, scientific achievements and the participation of all interested parties. “Green economy” respects cultural values, takes into account ethical aspects, provides for the growth of public awareness, the development of education and certain skills. The good governance and accountability principle is that the “Green economy” assumes that all markets are regulated on the basis of consultation with all interested parties. It promotes the development of international cooperation and defines international responsibility and the strengthening of democracy. The generations principle determines that the financial sector will in every possible way contribute to the development of various models of a sustainable “green economy” and the economy promotes the adoption of various decisions for the long term, regulates the financial sector and limits various speculations. The efficiency and sufficiency principle contains a list of provisions defining economic relations, namely: helping to ensure that the prices of goods and services reflect the real costs of their production and sale, product life cycle management, compliance with the principle “he who pollutes pays”, minimization of harmful emissions into the atmosphere, efficient use of resources, preference for renewable energy sources, promotion of social, economic and environmental innovations granting the right of access to intellectual property within the framework of the global legal framework. The resilience principle. “Green economy” provides for the development of the system of social protection and environmental protection and establishes a minimum level of social protection.

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The increase in waste generation indicators is associated with an increase in the standard of living, taking into account the relationship between the dynamics of GDP per capita and the levels of specific waste generation. According to the State Statistics Service of Ukraine 9, about 500 million tons of waste are generated in the country every year, including primary production waste (76%), secondary production waste (about 18%), agricultural waste (about 2%) and solid household waste (about 2%).

The authors studied, analyzed and compiled in the form of a comparative table according to EUROSTAT data indicators of the amount of waste in tons, GDP per capita in relation to the EU and Ukraine and their ratio in percentages (see tabl. 1).

Table 1

The results of the comparative table of indicators of the EU and Ukraine

EU	2011	2012	2013	2014	2015	2016	2017	2018
EU Total waste, tonne	2 227 600 000	2 242 300 000	2 243 045 000	2 243 790 000	2 251 350 000	2 258 910 000	2 298 455 000	2 338 000 000
EU GDP per capita (current US$)	35756	33158,89214	34578,05193	35286,11738	30485,02881	31186,51062	33094,40835	35753,36685
EU GE	62300,03356	67622,8865	64869,03903	63588,46387	73851,00451	72432,27778	69451,46068	65392,4429

UA	2011	2012	2013	2014	2015	2016	2017	2018
UA Total waste, tonne	447 641 200	450726800	448117600	354803000	312267600	295870100	366 054 000	352 333 900
UA GDP per capita (current US$)	3704	4004,804443	4187,739746	3104,643311	2124,662354	2187,730469	2638,326172	3096,561768
UA GE	120853,4557	112546,5192	107007,0318	114281,4051	146972,8117	135240,6543	138744,786	113782,2935

Source: authors according to [9].

Based on the table, a bar chart and graphs are built for a more detailed study.

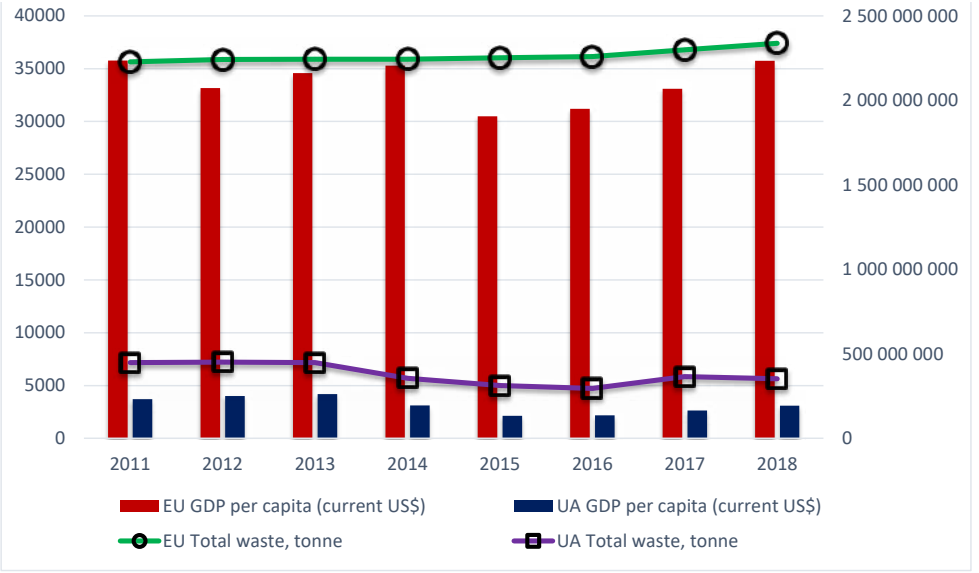

Fig. 3. Bar chart of indicators of the EU and Ukraine

Source: authors according to [11].

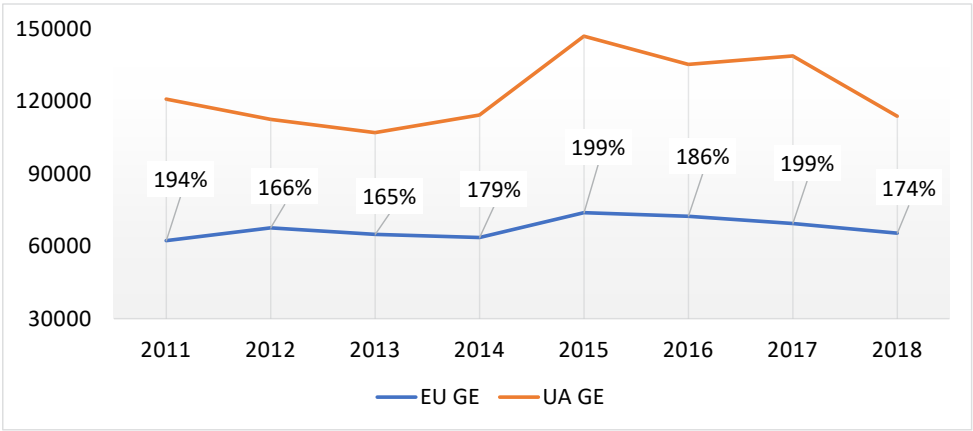

Fig. 4. Percentage ratio of indicators EU GE, UA GE
Source: authors according to [11].

Green growth indicators were proposed by the OECD in 2011 to track progress in four areas of the "green economy", namely: the transition to a low-carbon, resource-efficient economy; preservation of the natural resource base; improving the quality of life; implementation of appropriate policies to use the economic opportunities of green growth.

To monitor progress on the path to "green" growth, the OECD suggests using 5 groups of indicators, four of which cover different segments of the «green» economy, and the fifth-macroeconomic indicators of national development: environmental and resource productivity; base of natural assets; environmental aspects of the quality of life; economic opportunities and political decisions; socio-economic context and characteristics of economic growth [10]. Let's take a closer look at indicators of environmental and resource productivity, which determine the level of efficiency in the use of natural capital. Indicators of environmental and resource productivity describe key aspects of the transition to a low-carbon and resource-efficient economy. Environmental performance indicators include: carbon productivity of GDP; energy productivity of GDP. Indicators of resource productivity include: material non-energy productivity of GDP; GDP waste productivity; water productivity; balance of humus and nutrients substances [10].

Consider the following indicators. Carbon productivity of an economy is the economic value of goods and services produced per unit of carbon dioxide emissions from the combustion of fossil fuels. Production-based CO2 productivity is calculated as real GDP generated per unit of CO2 emitted (USD/kg). Included are CO2 emissions from combustion of coal, oil, natural gas and other fuels. Instead energy productivity of the economy is the economic value of goods and services produced per unit of total primary energy supply (TPES). Energy productivity is calculated as GDP per unit of TPES (USD/toe). It reflects, at least partially, efforts to improve energy efficiency and to reduce carbon and other atmospheric emissions. Together with energy intensity, these indicators also reflect structural and climatic factors. TPES includes production + imports - exports - international marine bunkers - international aviation bunkers ± stock changes.

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We consider it necessary to consider indicators of the share of renewable energy sources, namely the share of renewable energy sources in TPES is the share of energy from RES in the total primary energy supply. The source of data is the statistical collection "Fuel and Energy Resources of Ukraine" (Ukrstats). Renewable energy supply is calculated as a share of renewable sources in TPES (expressed as percentage). Renewables include hydro, geothermal, solar (thermal and PV), wind and tide/wave/ocean energy, as well as combustible renewables (solid biomass, liquid biomass, biogas) and waste (renewable municipal waste). And the share of renewable energy sources in electricity generation is the share of renewable energy in total electricity generation. Data source - regular information on the operation of the power complex (Ministry of Energy of Ukraine). Renewable electricity is calculated as a share of renewables in electricity production (%). Renewables include hydro, geothermal, solar (thermal and PV), wind and tide/wave/ocean energy, as well as combustible renewables (solid biomass, liquid biomass, biogas) and waste (renewable municipal waste). Is no less important GDP material intensity index - an indicator of the ratio of the volume of materials/raw materials used by sectors of the economy (volume of domestic consumption of materials) in the period for which the calculation is made, to GDP in the same period at reference/base year prices, % to base year (base year = 100%). Non-energy material productivity is calculated as GDP generated per unit of materials consumed (USD/kg). The generation of household and similar waste is the amount of waste collected per person. Municipal waste generated in expressed in kg per person. Municipal waste is waste collected by or on behalf of municipalities. It includes household waste originating from households (i.e. waste generated by the domestic activity of households) and similar waste from small commercial activities, office buildings, institutions such as schools and government buildings, and small businesses that treat or dispose of waste at the same facilities used for municipally collected waste.

The following final indicator is the balance of nutrients is calculated as the ratio between the total supply of nutrients (nitrogen, phosphorus, potassium) and their removal per unit area of agricultural land. The balance is compiled published in the periodic report on the state of soils. Nitrogen balance is calculated as the difference between the total quantity of nitrogen inputs entering an agricultural system (mainly fertilisers, livestock manure), and the quantity of nitrogen outputs leaving the system (mainly uptake of nutrients by crops and grassland). Phosphorus balance is calculated as the difference between the total quantity of phosphorus inputs entering an agricultural system (mainly fertilisers, livestock manure), and the quantity of phosphorus outputs leaving the system (mainly uptake of nutrients by crops and grassland).

We will also consider Environmental Quality of Life Indicators, which identify risks to health and safety, availability of amenities and ecosystem services, and the impact of the environment on livelihoods, in particular through assessing access to water or the disruptive effects of polluted air. Indicators of environmental aspects of quality of life include: level of air pollution; average life expectancy at birth; expected healthy life expectancy; access to centralized sewerage; share of households connected to the water supply.

The amount of emissions of pollutants into the atmosphere per unit area is an indicator that characterizes the density of emissions of pollutants that enter the atmosphere from stationary and mobile sources of pollution.

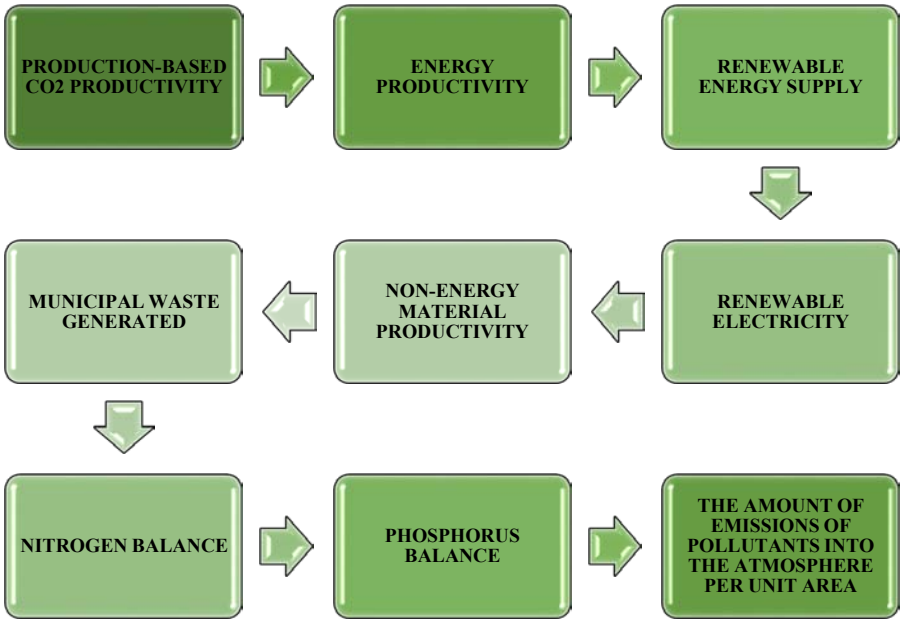

Fig. 5. Green growth indicators

Source: authors according to [11].

"Greening" the economy is a way to eradicate poverty. There is a direct relationship between poverty eradication and the rational management of natural resources and ecosystems, as the poor directly benefit from the increase in natural capital.

Many countries use various tools of the «Green economy"in their national policy and development strategy. The Republic of Korea was the first country to announce the implementation of the concept of "green" growth as a national strategy. The share of Brazil, China and India in global investment in renewable energy increased from 29% in 2007 to 40% in 2008. In 2003, South Africa introduced a tax on plastic bags. In Brazil, 95% of all aluminum cans and 55% of all plastic bottles are recycled, half of all paper and half of all glass are reused. And the Danish capital, Copenhagen, plans to become the world's first capital with zero greenhouse gas emissions. In Germany, investments in environmental technologies are expected to quadruple in the coming years: by 2030, they will account for 16% of the products produced and more jobs than in the automotive industry.

The implementation of the "Green economy" model involves the growth of the role of the state and intergovernmental bodies in economic regulation, creation of conditions for business development based on new environmental standards and technologies of cleaner production, greening of industrial sectors of the economy. In the conditions of resource and energy dependence of Ukraine, which is formed by a situation where ecologically harmful technologies are used at outdated energy-inefficient enterprises, it is the gradual replacement of the "brown" industrial economy with a new "green" one as a strategic priority of development that gives a chance to ensure the national security of the state in the coming decades.

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The Verkhovna Rada of Ukraine decided to approve the basic principles (strategy) of the state environmental policy of Ukraine for the period up to 2030. According to this, the root causes of Ukraines environmental problems were outlined and possible ways to overcome them were proposed; purpose, principles, principles and tools of state environmental policy; strategic goals and objectives; the stages of implementation of the state environmental policy of Ukraine are given.

The priority program for the development of Ukraine in the field of "Green economy"is the "Eastern Partnership GREEN" program. "Greening the economy in the countries of the Eastern Partnership" is a large regional program implemented by the Economic Commission for Europe of the United Nations (UNECE), OECD, UNEP and UNIDO, which aims to help six countries of the Eastern Partnership (EaP): Armenia, Azerbaijan , Belarus, Georgia, the Republic of Moldova and Ukraine - to move to a "Green economy" [12]. It helps preserve their natural capital and enhance people's environmental well-being by supporting environmentally-related actions, demonstrating and opening opportunities for greener growth and establishing mechanisms to better manage environmental risks and impacts.

Summarizing the above, we can consider that reducing the amount of waste or ensuring its proper disposal is an important part of the current development process of Ukraine to protect life and livelihoods and transition to a vibrant green and sustainable economy.

A "green economy" is socially inclusive, produces very little carbon and is resource efficient. State and private investments in increasing the share of renewable energy sources, increasing energy efficiency, reducing greenhouse gas emissions and waste are a key factor in economic growth, jobs, incomes and prosperity of the Ukrainian economy.

The "Green economy" is based on alternative sources of energy and fuel, environmentally friendly production technologies, clean technologies in agriculture, "green construction", as well as programs for cleaning air, water and soil from pollution, processing and disposal of waste, etc.

Many scientists are researching this topic, developing new concepts. It is the "Green economy" that can become the source of Ukraine's development. Therefore, the prospects of creating a green economy in Ukraine are becoming necessary and quite achievable.

Conclusions and prospects of further research. The concept of "green economy" is defined, which is based on minimizing the impact on the environment, social justice, ensuring a high level of well-being. The concept of "green economy" has gained special importance in recent years. The goal of the "green economy" is the formation of an effective environment for economic and social progress, based on minimizing the negative impact on the environment and effective use of natural resources while maintaining a decent population balance; reducing waste or ensuring its proper disposal is an important part of the ongoing process of economic development to protect lives and livelihoods and transition to a vibrant green and sustainable economy.

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Роман ЗВАРИЧ,
доктор економічних наук, професор,
завідувач кафедри міжнародних економічних відносин,
Західноукраїнський національний університет,
вул. Львівська 11, м. Тернопіль, 46020, Україна,
e-mail: romazvarych@yahoo.com
ORCID ID: 0000-0003-3741-2642

Ольга МАСНА,
PhD студентка кафедри міжнародних економічних відносин,
Західноукраїнський національний університет,
вул. Львівська 11, м. Тернопіль, 46020, Україна,
e-mail: m_a_c_n_a_o_l_i_a@ukr.net
ORCID ID: 0000-0003-2592-5619

Ігор РІВІЛІС,
виконавчий віце-президент, головний операційний директор,
«M3 Technology LLC», Матаван, Нью-Джерсі, США.
PhD студент кафедри міжнародних економічних відносин,
Західноукраїнський національний університет,
вул. Львівська 11, м. Тернопіль, 46020, Україна,
e-mail: igor@rivilis.com
ORCID ID: 0000-0003-3764-2843

МЕТОДОЛОГІЧНІ ЗАСАДИ ФОРМУВАННЯ КОНЦЕПЦІЇ ЗЕЛЕНОЇ ЕКОНОМІКИ

Анотація

Вступ. *Зелена економіка – це економіка, яка спрямована на зменшення екологічних ризиків та екологічного дефіциту, і яка зосереджена на сталому розвитку без погіршення стану навколишнього середовища. Вона тісно пов'язана з екологічною економікою, але має більш політично прикладну спрямованість. Зелена економіка є соціально інклюзивною, виробляє дуже мало вуглецю та є ресурсоефективною. У цьому аспекті особливого значення набуває проблема формування нових шляхів розвитку для відновлення природного середовища, забезпечуючи при цьому гідний рівень життя людей. Серед важливих результатів таких пошуків є концепція «зеленої економіки» та показники «зеленої економіки», їх адаптації до реальних умов країни та регіонів.*

Мета статті *полягає в дослідженні та аналізі методологічних засад формування концепції зеленої економіки, її основних принципів та індикаторів.*

Методи. *Методологічну основу дослідження становить теоретичне узагальнення і порівняння, аналіз та синтез, проведення наукового пізнання з метою визначення поняття «зелена економіка» та концепції «зеленої економіки». Статистичною та фактологічною базою дослідження є офіційні дані статистичної організації Європейської Комісії - Євростат.*

Результати. *Визначено концепцію «зеленої економіки», що грунтується на мінімізації впливу на довкілля, соціальній справедливості, забезпечення високого рівня добробуту. Концепція «зеленої економіки» останні роки набуває особливого значення. Її мета – сформувати ефективне середовище для економічного та соціального прогресу, засноване на мінімізації негативного впливу на навколишнє середовище та ефективному використанні природних ресурсів за збереження гідного балансу населення; зменшенні кількості відходів або забезпеченні їх належної утилізації, що є важливою частиною поточного процесу розвитку економіки для*

захисту життя та засобів до існування та переходу до живої зеленої та сталої економіки.

Перспективи. *Перспективи подальших досліджень полягають у виробленні пропозицій щодо застосування принципів та концепції «зеленої економіки» для переходу та розвитку вітчизняної «зеленої економіки».*

Ключові слова: *«зелена економіка»; охорона навколишнього середовища; сталий розвиток.*

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