

# Formation of the “Green Economy” in the Innovative Model of Sustainable Ukraine’s Development

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**Abstract.** The purpose of the study- is to substantiate the problems and prospects of forming a "green " economy and a way to implement sustainable development at the national level. Regional and global levels in the long run. The active growth of "green" enterprises, the introduction of innovative technologies and the reduction of waste and harmful emissions in various sectors of Ukraine's economy, the transition to energy-saving technologies and biofuels and "greening" of agriculture promise to ensure the country's energy security. This allows for increased incomes and formal employment in these sectors of the economy in the short and long term, while providing more environmental, economic and social benefits, which in general leads to a higher level of well-being of the population and the country. At the same time, although the transition to a "green " economy will require large-scale investments, these investments can be mobilized through sound government policies and innovative financing mechanisms.

## 1 Introduction

In recent decades, the economic growth of both Ukraine and world countries has been achieved mainly through the use of natural resources; humanity did not allow reserves to recover, but allowed ecosystems to degrade and disappear. The shortage of clean drinking water on the planet, depletion of the soil, deforestation, energy overruns, carbon emissions, and other problems make it possible to create a socio-ecological and economic catastrophe. It is the transition to a "green" economy that will reduce the impact on the environment per capita without reducing the quality of life. But for the transition to a green economy, conditions conducive to this must be created. These conditions include: relevant national regulations, policies, subsidies and incentives, the global marketplace, legal infrastructure, trade and financial aid protocols. The conditions prevailing today are favorable and conducive to the continuation of the "brown" economy and the era of misallocation of capital. "Greening" of many sectors the economy can bring sustainable and positive results such as asset and output growth, decent employment and poverty reduction. In Ukraine, there is a huge potential for the development of a new innovative model of sustainable development - "green economy". This is confirmed in the article by the adoption of a number normative legal documents, the introduction of nature-saving innovative technologies at enterprises, the development of organic farms and the growth of "green" enterprises in Ukraine. However, there are many problems and obstacles on the way to the formation of a "green"

economy in Ukraine. And this is also discussed in this study. The purpose of the article is to identify the prerequisites and justify the need for Ukraine's transition to a "green" economy as an innovative model of sustainable development. To achieve the goals in the article were set such following parameters as: 1) to define the basic terms and concepts; 2) substantiate the prerequisites and necessary for the development of a "green" economy in Ukraine; 3) reveal the problems and obstacles to the formation of a "green" economy in Ukraine; 4) present a SWOT- an analysis of the development of the "green" economy, which will determine the advantages and prospects for the development of the "green" economy. It is in the substantiation of the goal and the tasks set that the relevance of the study and its novelty.

A necessary condition for achieving innovative development is to change the system of social values in order to transform the established market form of management in a socialized and green environment. Thus, a "green" economy that develops on such a basis must create conditions for maintaining the health of the current generation, improving its material well-being, spiritual and social development, and all this will serve as the basis for the progress of human civilization in the future. A number of components of the "green" economy, as a rule, include the production of environmentally friendly products and the provision of adequate services, the implementation of socially responsible investments, the formation of corporate social responsibility [1].

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## 2 Literature review

Ukraine is currently going through difficult times in the transition to a new format of management in the world system. Against the background of deteriorating socio-economic and political situation, Ukraine did not miss COVID-19, which brought many negative consequences. The issue of ecological crisis and non-reproduction of natural resources has also become acute. The global terrestrial ecosystem has lost its capacity for natural self-regulation and reproduction, and society must now become its main regulator, and its own future depends on how it performs these functions. Mankind is faced with the dilemma "if people do not remove the contradiction between themselves and nature, the latter will solve it at the expense of humanity.

Recently, scientific research on solving economic and environmental problems has been widely deepened, which has given impetus to the formation of an innovative model of sustainable development - the "green" economy. These fundamental works are the subject of attention of domestic and foreign scientists. In particular, the following works are devoted to the development of these issues: Georgeson L. & Maslin M. [2], Yi H. & Liu Y. [3], Aldy J. [4], Carfi D. & Schilirò D. [5], Jackson T., & Victor P. [6], Vona F., Marin G., & Consoli D. [7], Iermakova O. [8], Boronos V., Plikus I. & Sokolenko L. [9], Kaletnik G. & Lutkovska S. [10] and others.

Scientists emphasize the need to use new ways to address environmental issues, in connection with which they justify the development of a "green" economy as one of the promising ways to form an innovative model of Ukraine. But the research can not be considered complete. They need further concretization and deepening.

Currently, the "green" economy is developing around the world. Its role in economic development and employment is justified in a study by Georgeson L. & Maslin M. [2] and is estimated at \$ 1.3 trillion. in the United States. Compared to China, OECD members, and the G20, the United States has a larger share of the working-age population in the green economy (4%) and higher per capita sales. To remain competitive, the United States is implementing energy and environmental policies at the federal level in this sector of the economy, which are vital to combating climate change and protecting the environment.

This can be a "breakthrough" strategy for Ukraine in this direction, including the introduction of modern innovative industrial technologies based on supporting the development of high-tech industries (increasing production of domestic aerospace technologies, instrumentation, electronic technologies, nanotechnologies, medical technologies), and eco-technologies and energy-saving technologies in all sectors of the economy (Kaletnik, G. & Lutkovska S. [10]). The authors prove that the development of "green" business is impossible without the formation and use of appropriate management capacity, innovators-managers who will be able to competently "start" all other potentials of the innovation system.

Ukrainian rate to implement an "innovative model of sustainable development", which provides an increase in the quality of life of the population through innovative economic development, was announced by the Government of Ukraine, but did not implement certain measures to achieve this strategy. The authors Boronos V., Plikus, I., Sokolenko L. [9] in their study among the main reasons indicate the inefficiency of management at all levels. The authors propose measures to accelerate the integration of Ukraine's economy into the world economy by forming an innovation-oriented economy, an economy based on environmentally friendly technologies, which are the basis of innovative changes in Ukraine and provide "green growth" to which the world aspires.

That is why, Iermakova O., argues the innovation-is an integral part of the "green economy", which improves people's well-being and ensures social justice, significantly reducing risks to the environment. Most developed countries consider the "green" economy as innovative and a priority in the long run. In order to promote the implementation of the principles of the concept of "green economy" in the regions of Ukraine, the author proposes the introduction of areas of smart specialization, which should be tested in accordance with sustainable development goals in Ukraine in the context of social, economic and environmental goals. The study emphasizes that the globalization of the innovation paradigm of the concept of "green economy" is manifested through a combination of local socio-ecological and economic environment of the country / region with integration into global networks, thus providing environmentally friendly innovation with appropriate resources (financial, human, technical, information) from local and global sources, facilitating access to them and creating opportunities for their use, which requires proper institutional support "[8].

In the works of Vona F., Marin G., Consoli D. [7] the main methodological novelty is a new measure of environmental employment, based on the content of the tasks of professions. To this end, the data of local labor markets in the United States and the reasonable consequences of "green" employment were studied. The analysis showed that one additional green job is associated with 4.2 new jobs in "non-green" activities. The authors determined that environmental employment is pro-cyclical, highly skilled and requires a 4% wage increase and is geographically linked.

Interesting are the studies of Yi H., Liu Y., which showed that "... cities located in the province with a clean energy policy have 54.3% more green jobs and 61.8% more green enterprises compared to cities located in the province without such a policy", which explains variation between cities in China [3].

The transition to a sustainable low-carbon economy is a huge problem, which is primarily related to the investment mechanism. In particular, investments should focus on resource productivity, renewable energy, clean technologies, business ecology, climate adaptation and ecosystem protection. Traditional investment models will change, say authors T. Jackson, P. Victor [6]. The function of innovations, which is

focused on achieving socially significant goals of innovative sustainable development of the state, will remain important. The authors substantiate that investments in renewable energy are competitive. Other investments can only pay off in the long run. And investing in ecosystem improvement and climate adaptation may not be profitable at all, although they protect vital ecosystem services for the future and can also promote employment. That is why investing in "green" innovation can only benefit on a long-term basis.

Therefore, the definition of problems and prospects for the development of "green economy" in the formation of a model of sustainable development of Ukraine requires further in-depth study, as developed countries at the present stage form a policy of neo-industrial type.

### 3 Research methodology

To solve the set tasks were used such general and special methods as: morphological analysis – during clarifying the conceptual and categorical apparatus of scientific research; system-structural approach – in completing the theoretical and methodological basis of ensuring and carrying out the formation of concepts of "green" economy as a way of implementing the course of sustainable development of Ukraine's economy; economic and statistical – in the study of the dynamics organic farms and eco-based production of Ukraine; graphic – to reflect their trends; functional – in characterizing the effective tools of formation and regulation of the "green" economy in Ukraine; SWOT-analysis and grouping – for further directions and prospects of the "green" economy, classification-analytical – to identify obstacles and drivers of the "green" economy of Ukraine; logical – to build a structure and describe the results of the study.

The statistical, factual and informational basis is compiled by the works and developments of leading domestic and foreign scientists and practitioners on research issues, current legislation, reporting data of Ukrainian enterprises, the results of their own scientific research, official publications of domestic and international organizations, Internet resources

### 4 Results

In scientific research, the concept of "green economy" is an integral attribute of innovative and sustainable development, namely meeting the needs of both present and future generations, ensuring a harmonious way of combining economic and social activities of society while preserving and properly reproducing the environment. Sustainable development is considered as a model of functioning of an integrated and innovative socio-ecological-economic system with limited parameters, which provides a balanced dynamic balance between its components for a long time. The principles of sustainable development and the model of green economy are the basis of the development strategy of the EU "Europe 2020" and countries with a high level of quality of life. Ukraine, territorially located in Europe, has been an independent state since 1991 and is currently undergoing a difficult stage of economic and social transformation.

The "green economy" according to a UNEP report - is "a low-carbon economy that uses resources efficiently and is in the interests of society as a whole." In a green economy, income and employment growth is driven by public and private investment in measures and projects that reduce carbon emissions and pollution, increase energy and resource efficiency, and work to prevent biodiversity loss and ecosystem services. These investments need to be catalyzed and supported through targeted public spending, subsidies and incentives to promote the development of "green" sectors, the development of markets for "green" technologies and innovations, improve regulatory policies and financial aid flows, the transition to "green" public procurement [11].

The rating agency Dual Citizen has developed the Global Green Economy Index (GGEI), which has established the efficiency and progress of the "green" economy in 130 countries.

The results of the expert survey showed that Ukraine ranks 120th among the world's leading countries [3].

This confirms the significant existing obstacles to the development of Ukraine's economy. But it should be noted that there are prerequisites and drivers for the development of "green" economy (table 1).

**Table 1.** Obstacles and drivers of development of the "green" economy of Ukraine.

Obstacles	Drivers
Insufficient awareness of green modernization of the economy, energy and resource efficiency	Informing about green modernization of the economy: local authorities; public organizations; international organizations; independent search for information
Outdated legislation and administrative barriers to green modernization	Simplification of the procedure and development of the legal framework
High cost for energy and resource efficiency measures	Calculation of expected economic efficiency from energy and resource efficiency measures and attraction of own reserves and partial attraction of credit funds
Obsolete energy and resource-consuming equipment	Application of new technological solutions for the introduction of energy and resource efficiency
Management does not understand the benefits of energy efficiency	Proving the economic attractiveness and technological feasibility of the project to increase energy and resource efficiency
Long payback period for renewable sources	Schemes of preferential business lending
Lack of experience and professional skills in implementing	Environmental management training

environmental management systems	
Disinterest and ignorance of potential buyers in environmental goods and services	Information and advertising
High costs of financing the production of environmental goods and services	Improving the company's image and expanding the market
Difficulties in obtaining loans for green modernization - a complex bureaucratic system	Deregulation
Low environmental awareness of staff	Informing staff, raising environmental awareness
Lack of processing of some types of waste in Ukraine	Promoting the introduction of new technologies for waste processing

*Source:* created by the authors based on [8;9].

A new strategy of the state environmental policy of Ukraine until 2030 came into force on January 1, 2020. Law 2697-VIII "On Basic Principles (Strategy) of the State Environmental Policy of Ukraine until 2030". What will be implemented in Ukraine according to the new document? The law defines 5 strategic innovative and environmental goals: 1) formation in society of ecological values and principles of sustainable consumption and production; 2) ensuring sustainable development of Ukraine's natural resource potential; 3) ensuring the integration of environmental policy in the decision-making process for innovative and socio-economic development of Ukraine; 4) reduction of environmental risks in order to minimize their impact on ecosystems, socio-economic development and public health; 5) increase liability for damage caused to the environment, in accordance with Ukraine's international obligations. Therefore, Ukrainian economy needs to prepare for change in advance - to develop business while preserving the environment [12].

Today, "green" economy offers solutions to some of society's most pressing environmental problems:

**Table 2.** Ukrainian companies that most actively implement environmental technologies and reduce emissions

Name of Company	Characteristic	Location
Agro-industrial holding MHP: SE "Victory Nova", PJSC "Myronivska Poultry Farm", NVF "Harvest" Katerynopil Elevator LLC [14]	Particular attention should be paid to related to environmental - corporate social responsibility, they help communities in their highest priority issues: co-financing of utilities, repair or construction of new roads, etc.	Regions: Vinnytsia, Cherkasy, Zhytomyr, Kyiv, Sumy, Ivano-Frankivsk, Ternopil, Lviv, Donetsk
NIBULON LLC [15]	is one of the largest domestic producers and exporters of agricultural products (wheat, barley, rapeseed, corn, sorghum, soybeans, sunflowers, etc.).	Regions: Mykolaiv, Zhytomyr, Luhansk, Khmelnytsky, Cherkasy, Kharkiv, Vinnytsia, Sumy, Poltava
PJSC "Dickerhoff Cement Ukraine" [16]	for 10 years provides delivery of high-quality cement to the territory of our state	Volyn region
PJSC "Zaporizhstal" [17]	The company implements resource-efficient technologies. More than 10 billion hryvnias were invested in modernization at the plant	Zaporozhye region
PJSC "ArcelorMittal Kryvyi Rih" [18]	Increases investment in the environment and continues to modernize its shops, which includes new treatment facilities	Dnipropetrovsk region

*Source:* created by the authors based on [14;15;16;17;18].

Ukraine has significant potential for the production of "green" products. Most Ukrainian "green" farms are located in Odesa, Kherson, Kyiv, Poltava, Vinnytsia, Zakarpattia, Lviv, Ternopil, and Zhytomyr regions. The size of Ukrainian certified "green" farms: from a few hectares (as in most European countries) - up to several thousand hectares of arable land. According to the Federation of Organic Movement of Ukraine, the area of certified agricultural land in Ukraine involved

design and construction of energy efficient buildings; recycling and safe waste management; development of renewable energy; wastewater treatment. "Green" economy includes three groups of companies: 1) companies whose activity is the production of environmental goods and services (traditional "Environmental goods and services sector"); 2) enterprises that have taken active and independent actions to change their products and / or processes, taking into account sustainable development ("green" companies / enterprises); 3) all other firms that take a number of measures to improve the efficiency of the process or change their image [13].

"Living Planet" and the State Ecological Academy of Postgraduate Education named the enterprises of Ukraine, which, in their opinion, are the most active in implementing environmental technologies and reducing emissions. They belong to innovative and socio-environmentally oriented enterprises, whose main mission is to preserve nature, introduce new environmentally friendly technologies and promote the development of environmental potential in the global market (table 2).

in the cultivation of various "green" products is more than 400 thousand hectares. According to this indicator, Ukraine ranks 20th among the countries of the world and first – among the countries of Eastern Europe. At the same time, the share of certified "green" areas among the total agricultural land of Ukraine is about 1%. The "green" sector in Ukraine specializes mainly in the production of cereals, legumes and oilseeds and dairy products. If in 2002 there were 31 "green" farms registered in Ukraine, which received

the status of "green", in 2015 there were 210 certified "green" farms, and in 2018 – 501 "green" farms, and the total area of agricultural land on which "green" production is carried out was 309100 ha. Studies by the Federation of the Organic Movement of Ukraine show that the modern domestic consumer market of "green" products in Ukraine began to develop in the early 2000s. In 2006, its volume amounted to 400 thousand euros, and in 2015 – up to 17.5 million euros, in 2018 - 33.0 million euros [19].

There are about 5,000 "green"enterprises in Ukraine. "Green"enterprises are branched out in all

spheres of economic activity of Ukraine, namely the sphere of crop production, animal husbandry, household chemicals, dairy production, grain crops and cereals, confectionery production. The largest share of the "green" market belongs to confectionery and chocolate products (16.04%), vegetable oils (14.74%), eco-vegetables (20.22%), eco-fruits and berries (14.28%). The largest percentage of "green" enterprises is in Kyiv region (23.08%), Dnipropetrovsk (7.94%), Kharkiv (6.36%), Odessa (6.28%), Lviv (6.2%), Vinnytsia (5.08%), and the smallest - Luhansk (0.82%) and Donetsk (1.9%) (table 3).

**Table 3.** "Green" enterprises of Ukraine by region

Region	Number of enterprises	The most famous representatives
Vinnytsia	254	ORGANIC-D, MAK-VAR ECOPRODUCT, BIO-FERM ORGANIC PLUS
Volyn	105	OLD PORITK, TSUMANSKY LISGOSP
Dnepro	397	ELIKSIR, SENCO-UKRAINE, ECOSAD
Donetsk	95	BIOPOLE, RADIST, CHOCOLATE WORKSHOP
Zhytomyr	110	GALEKS-AGRO, FITOSUROVINA, ORGANIC MILK
Transcarpathian	161	PAN-ECO, DZERELA KARPAT, STOVCONTINENT
Zaporozhye	180	MELITOPOL MEAT COMBINAT, RODNICHOK8 GURSOY
Ivano-Frankivsk	153	ECOPRODUCT, PROMETEY (FARM), EXPORT TREYD GROUP
Kyiv	1154	Arpolcr beyk-end Milling, Agro-ros, EST-ETUAL GROUP
Kirovograd	139	EKKO-CONTINENT, UKRAGROHIM
Luhansk	41	MVL-Ukraine, Prodgroupservice, NEONOLIN-ECO
Lviv	310	Fruit, group of company, Apro
Mykolayivska	169	STODOLA, Nature's Sunshine Products (NSP), SINTA
Odessa	314	BILOCHI-etno-farm, Bolgrad sirorobnyy zavod, Progresfarm, Hlibio
Poltava	139	Agnus, Agroecology, Bilocerktivska promyslova group
Sumy	89	AGROSVIT, LEV_GROUP, FIRM-ECO-SOYA
Ternopil	149	ZHIVA-ZEMLYA, Tepli gryadki, AGROZAGOTZBUT
Kharkiv	318	My Garden, Ecopolza, Mudriy dachnik, Internet – kramnitsa
Kherson	224	Amrita, Ecoferma Onuka, Euro-Service-Group
Khmelnitsky	150	ECOAGROPOSTACH, Global-Organic-Group
Cherkasy	159	Spivpratsya, Academ of organic gardening Ekogarden
Chernihiv	144	Gold Parmen, PLISKIVSKIY AGROPROMYSLOVIY COMPLEX, ECO-PRODUCT, PAN-ORGANIC
Chernivtsi	220	Lilak

Source: created by the authors based on [19].

## 5 Discussion

For Ukraine, "greening" of market is quite promising, especially in terms of exports to the EU, as such products are set at "zero" rates and quotas do not apply, and prices are usually on average 30% higher than conventional counterparts. In this segment, the European market is already represented by Ukrainian companies engaged in the production of birch sap, concentrated juices, sublimated, fresh and frozen fruits, cultivation and sale of cereals, etc., although the volume of their supply is clearly insufficient. Ukraine's "green" exports are amount to \$ 350 million and

continues to grow, while "green" imports are about \$ 700 million. The global volume of "green" trade in 2020 has tripled - to \$ 2-3 trillion [20].

At the same time, "greening" of agriculture involves not only the production of organic products, but also the cultivation of energy crops and their use for energy purposes - for the transition to biofuels. Thus, on the one hand, Ukraine strengthens its competitiveness in European markets by exporting products, and on the other hand, it reduces the need for traditional energy sources, contributing to the country's energy security. SWOT-analysis of the concept of "green" economy development in Ukraine is presented in table 4.

**Table 4.** SWOT-analysis of the concept of "green" economy development of Ukraine

<b>Strengths</b>
High quality products / services
Promoting stakeholder involvement and empowering local communities
Growing demand for "green" products and services that minimize environmental impact
<b>Weaknesses</b>
Low level of awareness about the organization of products among consumers
Higher price for "greens" than for traditional products or services
Lack of knowledge and competencies, which becomes a major obstacle to the development of "green" economy
Lack of a clear understanding of the possibilities of obtaining financial benefits from the transition to "green" economy
<b>Opportunities</b>
Global challenges of climate change and sustainable development
Search and generation of new ideas in various areas of business
Creating skilled jobs
Promoting energy, food and water security
Poverty reduction
<b>Threats</b>
Unregulated regulatory framework, which complicates the work of "green" economy
Lack or insufficiency of public and private funding for appropriate development and adaptation measures
Loss of jobs and the gradual disappearance of the "brown" economy
Lack of a single global approach to shaping green development shared by all countries and businesses, leading to controversy
Lack of correct measurement of "green" growth
Challenges to changes in consumer and production patterns and lifestyles that are commonplace

*Source:* created by the authors based on [20, 21].

The emergence of new solutions in the economy leads to the formation of new conceptual approaches, namely a balanced socio-ecological and economic, which covers the "green" economy, innovation and information and digital economy based on the principle of preserving the environment, "smart" and "green" production technologies, which are aimed at reducing the consumption of energy and material resources, automation of calculations, software, development of nano- and biotechnologies and creating added value through innovative intelligent solutions. The transition to a "green" economy objectively stimulates innovation effects, which must be supported by a favorable competitive environment and effective regulatory tools. It is important to emphasize that the concept of "green" economy does not replace the concept of sustainable development, but develops it and is a means of its practical implementation. "Green" development can be ensured only if the integration of environmental and economic policies so that social progress, economic growth and improving the quality of life of the population occur against the background of reducing threats to the environment [20].

In this way, the main advantages of the transition to a "green" economy are: 1) increasing wealth and ensuring the growth rate of GDP, as one of the main indicators of economic well-being; 2) the creation of new jobs to replace disappeared in the "brown" economy, which requires investments in retraining the workforce; 3) creating the value of natural capital as a source of human well-being and building it up in the interests of socio-economic progress. Among the factors influencing the "green" economy to increase the well-being of people and the welfare of the world economy are: 1) investing 0.03% of GDP by 2050 in the form of payments to forest owners intended for forest conservation can increase the added value in the forestry industry by more than 20%; 2) investing in "green" agriculture \$ 100-300 billion per year until

2050 will lead to increase in soil quality and an increase in the yield of the most important crops. This will partially solve the problem of food for the population; 3) increasing efficiency in the agricultural, industrial, municipal sectors will reduce the demand for water by 20%; 4) reorientation of government spending on improving fisheries will provide for the restoration of the world's fish stocks; 5) the allocation of 1% world GDP to improve energy efficiency and increase the use of renewable energy will create additional jobs, as well as ensure the provision of competitive electricity [21]. 6) the creation of "green" cities will increase the efficiency and productivity of labor; 7) "greening" transport will reduce negative impact on the environment and social costs. All these measures can increase income and formal employment of the population in these sectors of the economy in the short and long term, while providing more environmental, economic and social benefits. To transform the economy, needed concentrated pools of assets, similar to those controlled by long-term investors, such as: state financial institutions, development banks, sovereign wealth funds, as well as some pension and insurance funds that are free from obligations on short-term payments. Slesust also rationally apply subsidies, which may facilitate Ukraine's transition to a "green" economy. Taxes and other market-based instruments can be used to stimulate the necessary investment and innovation to finance the transition.

## 6 Conclusion and perspectives for the research

The "green" economy puts forward new requirements for business models and their management, changing technologies and the environment of their formation and implementation on the principle of advanced development and digitalization and gives preference to

information and innovation-oriented business models. This creates new challenges for new types of entrepreneurship. On the one hand, conditions are created for the emergence of new opportunities - the search and generation of new ideas in various areas of entrepreneurship, on the other - it causes a lack of knowledge and competencies, which becomes a major obstacle to the development of "green" entrepreneurs. The introduction of "green" economy in Ukraine will help solve many environmental, economic and social problems that currently constrain economic growth in the country.

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