REPUBLIC OF AZERBAIJAN

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ABSTRACT

of the dissertation for the degree of Doctor of Philosophy

POSSIBILITIES OF IMPLEMENTING GREEN ECONOMY MODELS OF DEVELOPED COUNTRIES IN AZERBAIJAN

Speciality:	5310.01 – The world economy
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GENERAL CHARACTERISTICS OF THE WORK

Relevance of the topic. In recent years, significant steps have been taken in the world economy towards the development of the green economy concept. The green transformation of the world economy makes the use of green economy building practices in Azerbaijan relevant. Modern trends, in turn, have included strategic issues such as the formation and development of a green economy model in Azerbaijan in relevant state programs.

At the same time, the principles of green economy and national and international legal regulation of the use of renewable energy sources are constantly being updated both at the level of international organizations, integration associations, and in individual states. The UN Environment Program, which has a special role in this area, defines green economy as an economic model that reduces environmental damage and eliminates ecological deficiencies without compromising social welfare and equality. The green economy aims to be low-carbon and socially inclusive , while ensuring the efficient use of resources. In this model, investments should be supported by public spending, economic reforms, and effective taxation policies . Joint cooperation between states, non-governmental organizations, associations, the private sector, and local governments is essential for the successful implementation of a green economy.

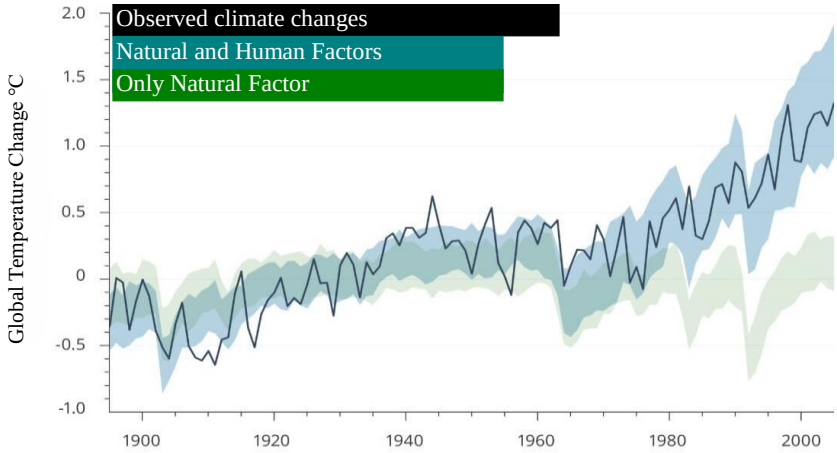
In developed and developing countries of the world, green economy construction allows cities to be made more sustainable as an alternative to the existing economic system [1]. If we look at it from the perspective of achieving sustainable economic development, green economy is an economic model of great importance for ensuring sustainable development. One of the factors that is crucial in establishing a green economy and ensuring its sustainability is the human factor. Thus, the role of the human factor is at the forefront not only in the use of resources, but also in ensuring long-term ecological and economic

[1] *Efremenko D.V. Anthropocentrism vs. biocentrism in discussions about stable development and interaction man and biosphere. Introductory Article // Anthropotekhnogennaya degradation biosphere: Proposals by her to overcome: Work Russian interdisciplinary scientific-practical conference, – M.: IHHOH PAH, – 2014. – c. 5-18.*

stability. The relevance of this approach can be seen on the basis of the trends reflected in Figure 1.

Figure 1. Natural and human factors causing global warming

Source: *National Climate Assessment. – United States: US Global Change Research Program, – 2014*



temperature change from 1900 to 2000, and the blue stripe shows the temperature The green line represents only natural factors that caused the temperature change. As can be seen from the figure, the temperature between 1900 and 1980 change has almost maintained its stability. The influence of natural and human factors on the change has taken the same equilibrium state. However, after 1980, natural and human factors have surpassed only natural factors, and thus global climate change has increased from 0 °C to 1.5 °C, and in our time, global warming has reached the level of 2015 Paris[2] The 1.5°C limit set by the Paris Agreement is exceeded. According to the Global Change Information System, if only natural factors such as volcanic eruptions and solar radiation were to affect climate temperature, the temperature would remain the same as in the 1900s. In recent years, gases released into the

[2] *United Nations. The Paris Agreement: [Electronic resource] / United Nations. – Paris, 2015. – URL: https://www.un.org/en/climatechange/paris-agreement*

environment as a result of human activities and changes made by humans to the environment are seen as the main causes of global[3] warming.

A green economy supports economic growth and development without compromising nature's ability to regenerate itself. This approach aims to ensure the sustainability of resources and ecosystem services that are essential for human well-being. According to the World Bank, a green economy allows for a more efficient use of natural resources and a sustainable development model that takes into account environmental hazards in order to reduce pollution and its negative impacts.

Thus, in recent decades, new challenges have been increasing regarding the green transition of traditional economic models to solve problems such as climate change, biodiversity conservation, etc., and the solution of social and economic problems arising from the economic reforms that necessitate this. As the global financial crisis and warming discussions intensify in the world economy, the emergence of the concept of green transformation of the national economy continues to become relevant.

The degree of study of the problem. Green economy is an important research area that has received increasing attention in recent years. Many leading science schools, scholars and research centers around the world are studying various aspects of green economy to ensure the transition to a sustainable future. The United Nations Environment Programme (UNEP), the World Bank, the Department of Economic and Social Affairs (UNDESA), the Conference on Trade and Development (UNCTAD), International Labour Organization (ILO), the Organization for Economic Cooperation and Development (OECD), the Global Green Growth Institute (GIGI), and the Green Economy Action Partnership (GEP) are conducting policy research on green economy and sustainable development. In Azerbaijan, prof. Ali Abbasov, prof. Vusal Gasimli, prof. Hajizade Elshan, prof. Zahid Mammadov, prof. Gorkhmaz Imanov, and globally, prof. Recep Bozoglan, prof. Yalchin A., prof. Andrey Fedyanin, prof. Paul Hawken, prof. Joseph Stiglitz, prof. Edward Barbier, prof. Researchers like Jennifer Clapp have studied this problem.

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[3] *National Climate Assessment . – United States : US Global Change Research Program , – 2014. – URL: https://nca2014.globalchange.gov/report/our-changing-climate/observed-change#statement-16550*

In general, the most common problems in green economy research can be systematized as follows:

1. Complexity: The green economy is a complex topic that spans many different disciplines, including economics, environmental science, sociology, and politics. This complexity can make it difficult for researchers to understand the different elements in the field and how they interact with each other.

2. Data gaps: There is a lack of data on many issues related to the green economy. This can make it difficult for researchers to analyze trends and developments in this area and assess the effectiveness of green economy policies.

3. The lack of many concepts in this field and the problem of measuring possible indicators create difficulties in comparing the latest results of studies conducted by researchers in the field of green economy and reaching a general conclusion.

4. Uncertainty: Uncertainty in many issues related to climate change, natural factors, and the impacts of human activity in the green economy.

5. the extreme strengthening of interdisciplinary relations and the use of research methods in the fields of nature, information and economics.

The purpose and objectives of the research. The purpose of the research is to study the conceptual foundations of the green economy in developed countries, to assess the current state of the green economy in Azerbaijan. to examine its status and potential, the resulting proposal and consists of preparing recommendations.

Based on the purpose of the research, tasks were identified and their solutions were making following the process in logical order implemented:

- Theoretical and conceptual framework of the concept of "green" economy the basics research,
- Determining the development directions of the green economy in the economies of developed countries,
- Development directions of this field in Azerbaijan, adaptation problems and assessment of integration potential,
- realizing the potential of the green economy in Azerbaijan.

The object and subject of the *research.* *The object of the study* is the green economy course implemented by developed countries. *The subject of the course is* the economic relations arising in the process of applying green economy tools in developed countries, the development processes of the green economy in Azerbaijan, methods of applying the experiences of developed countries in this field and measures to stimulate them.

The main provisions put forward for defense:

1. Green economy models support sustainable development and economic growth. By adopting these models, Azerbaijan can manage natural resources more sustainably and achieve long-term economic growth.
2. innovative practices from developed countries to Azerbaijan will contribute to the development of technological infrastructure and increase the competitiveness of agriculture. can contribute.
3. Green economy models are aimed at minimizing waste by increasing energy efficiency. By implementing green technologies in Azerbaijan's energy sector, it is possible to use renewable energy resources more efficiently, reduce negative impacts on the environment, and preserve ecological diversity.
4. will support the inclusive development of the Green Economy by creating an opportunity to attract finance at a lower cost than bank loans.
5. The state's green economy policy will greatly support the attraction of private investment in this area.
6. Studying and purposefully utilizing the potential of the Karabakh and East Zangezur economic regions in the direction of the Green Economy will support the reconstruction of the lands liberated from occupation.
7. experiences of the World Bank and regional development banks, developing green economy mechanisms, including ensuring their participation as investors in the issuance of green bonds and shares, will facilitate the development procedure of the liberated territories. will accelerate.

Scientific novelty of the research work. The main aspect of the scientific novelty of the research and the main scientific idea is the

formation of a conceptual approach to green economy models and the search for opportunities for their adaptation to the conditions of Azerbaijan and the identification of ways to implement them. The main scientific innovations of the research work are as follows:

1. Methods for implementing the "embryo" transformation approach have been identified - along with industry and business sectors, concrete proposals have been made regarding the efficient use of solar and wind panels, ensuring the understanding, accessibility and mass adoption of the green economy phenomenon in society.
2. Based on the experience of developed countries in the state's green economic policy, the principles of fiscal policy formation in this area have been determined - penalty mechanisms and methods for regulating state spending in this area have been selected.
3. Sustainable agricultural practices and implementation methods have been identified - the benefits of vertical farming have been substantiated.
4. Voluntary The creation of the Carbon Market – VCM has been proposed as a mechanism to compensate companies for their environmental impacts through carbon certificates.
5. Methods for implementing the mechanism for operating green bonds, an important financial instrument of the green economy, have been determined in the Azerbaijani Capital Market - proposals for the implementation of the Green Listing Program mechanism and the creation and stimulation of the Green Bond Market have been prepared and included in the action plan document of the Baku Stock Exchange's Strategy for 2024-2027.

Elements of scientific innovation are of an applied nature in the concept of the research, its main theses, and its algorithm.

The theoretical and methodological basis of the study is the green economy, the views of classical and modern scholars in this field, the main theories of the world economy: international division of labor, international movement of economic resources, the OECD 's "green growth" concept, the UN's triple concept of Sustainable Development, which combines economic, social and environmental components, and the emergence of new economic models related to it (green economy,

green growth, low-carbon economy, bioeconomy, blue economy, circular economy), as well as green economy theories.

At the present stage, a single methodology or a single integrated theoretical framework for assessing green economy activity models has not been developed. The theoretical concept of the green economy and existing research methods take into account the influence of individual parameters in individual countries and are somewhat subjective.

Separate scientific studies highlighting the topic of green models in the theoretical literature are based on broad interdisciplinary approaches to studying the implementation of "green" models: theories of sustainable development of society and industry, ESG concepts, and interdisciplinary cooperation in economic, sociological, and ecological fields.

The information base of the study consists of reporting materials, methodological recommendations of international economic organizations specializing in the study of "Green Economic Development" problems, scientific works and articles of leading researchers and experts in this field, and a number of scientific monographs prepared in this field.

the information base of the dissertation research is made up of international conventions, intergovernmental agreements, decrees and orders of the President of the Republic of Azerbaijan, national legislative acts, state programs and strategic roadmaps.

The methodological basis of the study is the use of general scientific and special scientific methods such as dialectical development, systematic approach, historicity, logic, comparative, etc., and regression analysis as a calculation. Methods of graphical interpretation of data, as well as economic and statistical methods were used. The system analysis method allowed us to give recommendations for the development of green economy practices of developed countries in Azerbaijan.

In the research and development of the dissertation work, scientific literature covering this topic, articles, conference materials, the Internet networks of the Presidential Library of the Republic of Azerbaijan, and separate information databases in different languages on the Internet for researching the problem were used.

Practical significance and validation of the research.

The practical significance of the dissertation work consists in

studying the share of the green economy in the economic development of the Republic of Azerbaijan, and in a number of proposals arising from the research in this area. The main provisions of the research work, the results obtained can be applied in the process of preparing programs, projects and proposals related to the regulation of the green economy, in scientific research works. The research as a result, the implementation of the recommendations put forward will further accelerate the implementation of the green economy. expansion and efficiency to be promoted positive impact to show can.

were recorded in 6 articles published in local and foreign scientific publications and in the materials of 4 international and republican-level scientific conferences.

were used in the process of preparing the Baku Stock Exchange Strategy for 2024-2027.

Structure of a research paper. A dissertation consists of an introduction, three chapters, 11 paragraphs, a conclusion, and a list of uses. literature consists of a list of. Introduction – 16339, Chapter I – 55112, Chapter II –72818, Chapter III – 81578, Conclusion –6392, excluding the first two pages and the list of references, it consists of 232239 conventional characters.

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BASIC SCIENTIFIC PROVISIONS PRESENTED TO DEFENSE

1. Green economy models support sustainable development and economic growth. By adopting these models, Azerbaijan can manage natural resources more sustainably and achieve long-term economic growth.

Approaches to solving the "development or ecology" dilemma at the global level. Although this concept implies certain limits on the use of natural resources, it emphasizes that these limits are relatively variable depending on the level of technology and social organizations.[4]

Table 1.
The evolution of the concept of Green Economy and its development over time.

Years	Processes	Main features
1970	The rise of the environmental movement	Issues such as the oil crisis, environmental pollution, and climate change led to the growth of the environmental movement. During this period, the first policies and regulations related to environmental protection began to be implemented.
1980	The emergence of the concept of sustainability	The concept of sustainability emerged in the 1980s. Sustainability is a development model that ensures the protection of natural resources for future generations. During this period, research on the concept of sustainable development accelerated.
1990	The emergence of the green economy concept	The concept of a green economy emerged in the 1990s. A green economy is an economic model that seeks to balance economic growth with environmental sustainability. During this period, research on the concept of a green economy gained momentum.
2000	Globalization of the green economy	In the 2000s, the concept of a green economy gained global traction. International organizations such as the World Bank, the United Nations, and the European Union have implemented policies and programs to develop a green economy.
2010	Spread of the green economy	The concept of a green economy gained widespread acceptance in the 2010s. Many developed and developing countries have begun to implement policies and programs that support a green economy.
2020	The increasing	Global challenges such as climate change have further

[4] *Development and international cooperation: Problems of the environment: Report of the World Commission on Environment and Development // — New York: UN, – 1987. – p. 412. – URL: http://www.un.org/ru/ga/pdf/brundtland.pdf*

	importance of the green economy	increased the importance of the green economy in the 2020s. Policies and programs supporting the green economy continue to be implemented around the world.

Source: The table *was compiled by the author.*

The main goal of the green economy model is to create a sustainable future, to create a clear roadmap, to support the development of a social and fair economy, and to boost economic performance. This can be seen from the statistical indicators of the Green Economy Index for OECD countries.

Table 2.

Green Economy Index (OECD countries)[5]

Country	2024 Result	2024 Ranking	Country	2024 Result	2024 Sorting
Costa Rica	0.953	1	Spain	0.741	20
Sweden	0.945	2	Netherlands	0.727	21
Switzerland	0.909	3	Portugal	0.702	22
Luxembourg	0.903	4	Australia	0.689	23
Denmark	0.866	5	Czech Republic	0.677	24
Ireland	0.861	6	Finland	0.670	25
Austria	0.834	7	Canada	0.669	26
Chile	0.831	8	Slovakia	0.667	27
Israel	0.823	9	New Zealand	0.664	28
France	0.811	10	Japan	0.659	29
United Kingdom	0.809	11	Hungary	0.658	30
Iceland	0.794	12	Slovenia	0.597	31
Lithuania	0.792	13	South Korea	0.595	32
Norway	0.770	14	Greece	0.573	33
Germany	0.763	15	Estonia	0.567	34
Belgium	0.755	16	Poland	0.558	35
Latvia	0.750	17	Colombia	0.522	36
USA	0.748	18	Mexico	0.475	37
Italy	0.742	19	Turkey	0.448	38

Source: *Global Green Economy Index (GGEI) 2022.*

The Global Green Economy Index (GGEI) is an index that measures the green economy and sustainability performance of countries. The GGEI covers 160 countries with 18 indicators. Table 2 shows the results calculated on the basis of greenhouse gas emissions/ GDP.

[5] *Index of Global Green Economy (GGEI). Full Data File Available // 2024, 5th May. – URL: https://dualcitizeninc.com/global-green-economy-index/ .*

The indicators have been calculated since 2005 according to the progress of countries and their proximity to global sustainability goals. The GGEI shows the index values of OECD countries and their corresponding rankings. The closer the values are to one, the closer the countries are to green economic goals.

Green economy models support sustainable development and economic growth. It is from this perspective that Azerbaijan, by adopting these models, creates a solid foundation for managing natural resources more sustainably and achieving long-term economic growth.

2. Innovative practices from developed countries to Azerbaijan can contribute to the development of technological infrastructure and increasing the competitiveness of agriculture.

In 2022, the total budget expenditure of the European Union countries on environmental protection amounted to 130 billion euros (approximately 1 percent of GDP per country), which is 0.8% more than the corresponding figure in 2021.

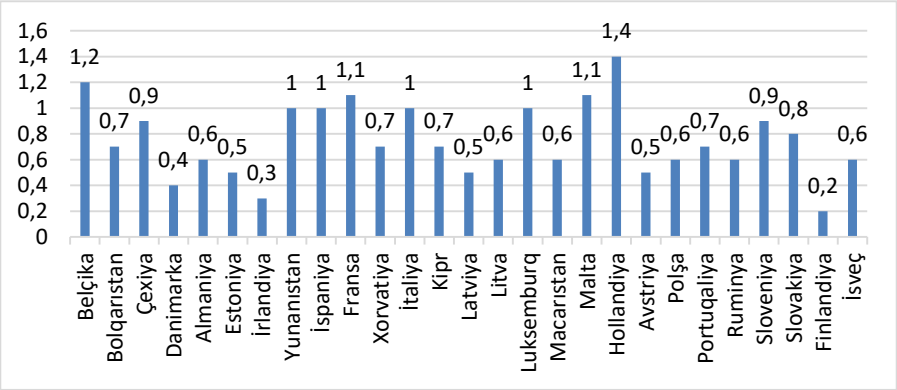

Chart 1. Share of public spending on the environment in EU countries as a percentage of GDP (in percent)

Source: *The table was prepared by the author based on the Eurostat database.*

The main technological advantages of the green economy are particularly evident in the agricultural sector. For example, vertical farming, which is widely used in developed countries, farming) is one of the best examples of this. Vertical farming involves growing plants on vertically arranged shelves or inclined surfaces. This method uses controlled environmental conditions to optimize plant growth and reduce

resource use. The main technologies in vertical farming can [6]be grouped as follows:

Hydroponics is a major technology that uses nutrient-rich water solutions to grow plants without the need for soil. This method allows for precise control of the nutrients supplied to plants, thus allowing for rapid plant growth and increased yields.[7]

Aquaponics is a system that combines fish farming with hydroponics. In this technology, fish waste serves as an organic food source for plants, while the plants help purify the water and return it to the fish tanks. This interdependence creates a sustainable and closed system, reducing waste and optimizing resource use [8].

LED lighting technology plays an important role in vertical farming by mimicking natural sunlight with energy-efficient light sources. LED lights provide optimal wavelengths for photosynthesis and are designed to stimulate plant growth. This technology allows plants to be grown year-round with less energy consumption than traditional lighting systems.

Advanced climate control systems are essential for maintaining optimal growing conditions in vertical farming farms. These systems provide the ideal environment for plants by regulating temperature, humidity, and carbon dioxide levels.

Automation in vertical farming involves the application of robotic technologies and artificial intelligence in processes such as planting, harvesting, and monitoring plant health. These systems increase operational efficiency, reduce labor costs, and increase accuracy in crop management. The use of artificial intelligence optimizes resource use and increases productivity by analyzing plant growth data.

One of the biggest advantages of vertical farming is its ability to use space more efficiently than traditional farming. With the use of vertical spaces, it is possible to produce more produce per square meter, making

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[6]*Pretty J., Bharucha ZP Sustainable Agriculture and Food Systems // Routledge. - L., 2019. - Vol. 2, N 3. – P. 112–124.*

[7] *Costantini, V., Mazzanti, M. On the green and innovative side of trade competitiveness? The impact of environmental policies and innovation on EU exports // – Research Policy, 2012, vol. 41, no. 1, pp. 132-153. DOI: 10.1016/j.respol.2011.08.004*

[8] *Jaffe, AB, Newell, RG, Stavins, RN A tale of two market failures: Technology and environmental policy. Ecological Economics. – 2005 Aug 1; 54(2-3): 164-74. DOI: 10.1016/j.ecolecon.2004.12.027*

it an ideal solution in urban areas where land is limited. Methods such as hydroponics and aeroponics use up to 95% less water than traditional farming [9]. These methods reduce waste by recycling water and minimize environmental impact. The controlled environment significantly reduces the use of chemical pesticides in agriculture. In urban environments, vertical farms bring food production closer to consumers, reducing the need for long-distance transportation and increasing food security [10].

The United States is a leader in vertical farming innovation, with numerous vertical farms located in urban centers such as New York, Chicago, and San Francisco. Companies such as AeroFarms, Plenty, and Bowery Farming are at the forefront of this field, using advanced technologies such as artificial intelligence, robotics, and the Internet of Things [11]. For example, AeroFarms operates one of the world's largest vertical farms in Newark, New Jersey, and can produce up to 2 million pounds of greens per year using 95% less water than traditional farming.

3. Green economy models are aimed at minimizing waste by increasing energy efficiency. By implementing green technologies in Azerbaijan's energy sector, it is possible to use renewable energy resources more efficiently, reduce negative impacts on the environment, and preserve ecological diversity.

Although Azerbaijan's energy sector has large reserves, economic diversification is essential for sustainable economic development. Reducing economic dependence and diversifying income sources by investing in different sectors of the economy is considered an element of the structural approach.

is shown in Figure 2. The reason for showing hydropower separately is that hydroelectric power plants cover a large area and destroy biodiversity under the HPP, the destroyed plants release methane and other harmful gases into the air, and the amount of oxygen in it decreases due to the restriction of water movement.

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[9] Apergis N., Payne JE Renewable energy consumption and economic growth: evidence from a panel of OECD countries // – Energy Policy, – 2010. – c. 38, no. 1, p. 656-660. – DOI: 10.1016/j.enpol.2009.09.002

[10] Morris, C., & Pehnt, M. The German Energiewende Book. – Berlin: Heinrich Böll Stiftung, 2016

[11]Batini N. The Economics of Sustainable Food: Smart Policies for Health and the Planet // Island Press. – Washington, DC, 2021. – Vol. 7, N 2. – P. 23–45.

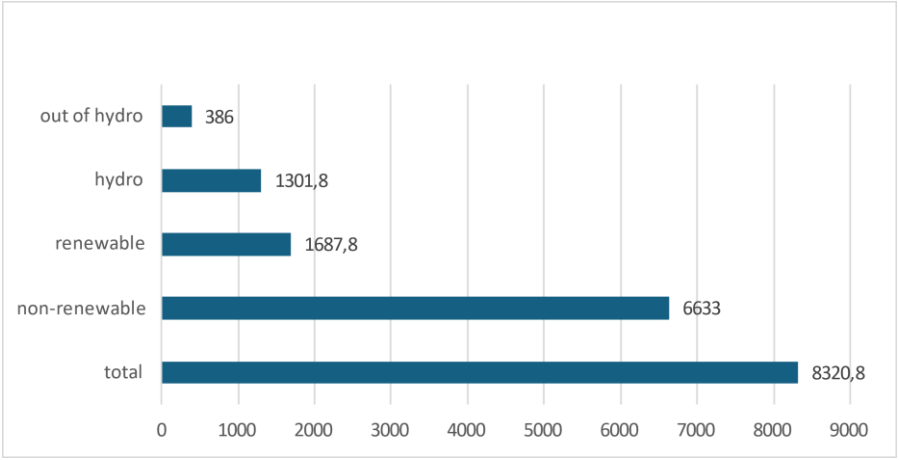

Chart 2. Total electricity generation capacity of Azerbaijan, MW, 2023[12]

Source: *Prepared by the author based on information from the Ministry of Energy*

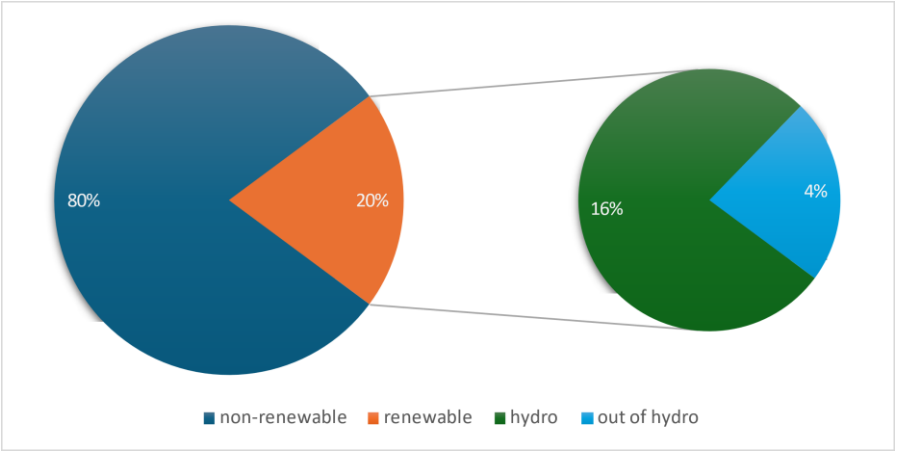

Chart 3. Distribution of total electricity generation capacity of Azerbaijan, in %, 2023

Source: *Prepared by the author based on information from the Ministry of Energy.*

[12] *Azerbaijan Republic Energy Ministry Official website – URL: https://minenergy.gov.az/*

Figure 3 shows the distribution of Azerbaijan's total electricity generation capacity. Based on the distribution, it can be seen that the share of renewable energy sources in the total electricity generation capacity in 2023 is 20%, of which 4% falls on renewable energy sources other than hydropower.

Renewable energy offers business opportunities such as the generation of electricity based on environmentally friendly energy sources and the manufacture and installation of technologies such as solar panels and wind turbines.

has emerged in response to important issues such as environmental sustainability and climate change. The use of fossil fuels and greenhouse gas emissions accelerate climate change. The green economy supports the fight against climate change by promoting elements such as low carbon emissions, renewable energy sources, and energy efficiency [13].

Table 3.
Waste by economic activity (thousand tons)

	2010	2015	2019	2020	2021	2022
Agriculture, forestry and fisheries	2.7	20.0	33.2	31.5	29.8	36.4
Mining industry	247.0	196.7	207.8	206.3	176.2	262.0
Processing industry	414.6	526.9	764.8	692.5	791.8	836.2
distribution of electricity, gas and water	1.6	4.6	5.7	7.6	2.3	4.8
Construction	0.6	3.3	2.9	3.1	2.1	43.8
Other types of economic activity	5.7	64.2	220.0	161.3	194.8	143.6

Source: *State Statistical Committee of the Republic of Azerbaijan*

Waste generation by economic activity increased 12 times in 2022 compared to 2010 in agriculture, forestry and fisheries, more than 1 time in the mining industry, 2 times in the processing industry, 3 times in the production and distribution of electricity, gas and water, 45 times in construction, and 28 times in other economic activities.

The implementation of green economy models in Azerbaijan will

[13] *Brundtland, G.H. Report of the World Commission on Environment and Development: Our Common Future. - 1987. - Table of Contents. – URL: www.un-documents.net/our-common-future.pdf*

not only lead to a reduction in energy consumption, but will also reduce waste released into the environment and serve to protect the environment.

4. The introduction of Green Securities to the Azerbaijan Capital Market will support the inclusive development of the Green Economy by creating an opportunity to attract finance at a cheaper rate than bank loans.

The introduction of Green Securities to the Azerbaijan Capital Market, in addition to supporting the inclusive development of the Green Economy, is being worked on a relevant plan to support companies investing in the green economy in environmental regulations. This, in turn, affects the demand for green securities through incentives and discounts.

Table 4

Annual issuance volume of green securities (USD [14]billion)

Country	2019	2020	2021	2022	2023
Germany	18.7	42.4	62.5	63.2	67.5
France	31.1	38	41.5	25	30
England	2.2	4.8	35.9	18.4	32.7
Italy	6.8	4.5	25.9	16.2	30.3
Spain	6.3	9.3	20.2	15.6	21.8

Source: *Climate Bond Prepared by the author based on the Initiative's database.*

This table shows the annual green bond issuance volume in Europe for 2019-2023. Since 2020 (the pandemic), there has been a sharp increase in green bond issuance. The highest increase from 2019 to 2023 was in the UK (14 times). In Germany, there was an increase of more than 260% in green bond issuance from 2019 to 2023. A decrease is observed only in France (4%).

The experience of developed countries shows that the introduction of Green Securities to the Azerbaijan Capital Market can play an important role in future economic development and capital flow, in addition to supporting the inclusive development of the Green Economy.

Green bonds, sustainability bonds, green stocks, and other financial instruments that meet environmental, social, and governance (ESG)

[14]*Climate Bonds Initiative . "Market Data " [Electronic resource] / Climate Bonds Initiative . – URL: https://www.climatebonds.net/market/data*

criteria that are traded on exchanges are considered more effective borrowing tools than traditional bank loans, and incentive policies are implemented for these securities.

The World Bank and International Regional Financial Banks (Asian Development Bank, European Bank for Reconstruction and Development) have supportive investment policies in these areas. Thus, they become direct investors in the long-term and low-interest bonds issued by companies that issue ESG (sustainable development-based) securities in accordance with their requirements. This is also a commitment for development banks to support the green economy.

5. The state's green economy policy will greatly support the attraction of private investment in this area.

The second dimension of national policies to be used in the transition to a green economy concept for sustainable development is sector-oriented fiscal policies. The sectors in question are those that cause intense pollution in production and consumption activities. Government fiscal incentives are very important in the areas of energy-efficient buildings, sustainable transport, investments in renewable energy sources, sustainable agricultural activities, sustainable forestry and effective water management. Fiscal incentives in these areas aim to create new jobs, reduce carbon emissions, and ensure efficiency in the use of natural resources.[15]

The main objective of this study is to show that government support in developed countries has a significant impact on investments in the green economy.

For this purpose, data on business investment in the renewable energy sector, government spending on the environment, the environmental policy stringency index, and environmental research and development spending for Germany, the United Kingdom, and South Korea were obtained from the official OECD website. The data on the variables cover the years 1995-2012.

[15]*UNEP. (2011). " Towards a Green Economy Pathways to Sustainable Development and Poverty Eradication A Synthesis for Policy Mixer "* , *http://www.unep.org/greeneconomy/portals/88/documents/ger/GER_synthesis_en.pdf*

Table 5

Long-Run Cycle Equation Results

Countries	Fixed	LEPE	LEPSY	LERRD	Crisis2008	Hypothesis
Germany	-12.853 *	2.6950 ***	0.3585	3.3318 ***	0.3122 *	✓
B. Kingdom	-2.9116	1.2409 **	-1.7096 ***	-0.4273 ***	0.9927 ***	✓
South Korea	5.9603	0.3713 *	-0.5556 ***	-0.9385 **	0.05847	✓

*, **, ***, indicate significance levels of ,10%, 5% and 1%, respectively.

According to the long-run equation obtained for Germany, when government spending on the environment increases by 1%, business investment increases by an average of 2.695%.

According to the long-run equation derived for the United Kingdom, when government spending on the environment increases by 1%, business investment will increase by 1.24% on average.

According to the long-run equation derived for South Korea, when government spending on the environment increases by 1%, business investment will increase by 0.37% on average.

As can be seen from the regression analysis, an increase in the severity index of environmental policy, that is, penalty mechanisms, will lead to a decrease in business investments in this area (Great Britain experience). Increasing state spending on environmental protection will increase business investments in the green economy. Therefore, in addition to the implementation of mandatory penalty mechanisms for the purpose of protecting the environment, attention should be paid to increasing the state's spending on ecology and the green economy in general, and to properly regulating this direction and adhering to the golden mean principle.

For financing "green" projects is the Feed-in Tariff (FIT) program, which encourages investments in renewable energy sources.

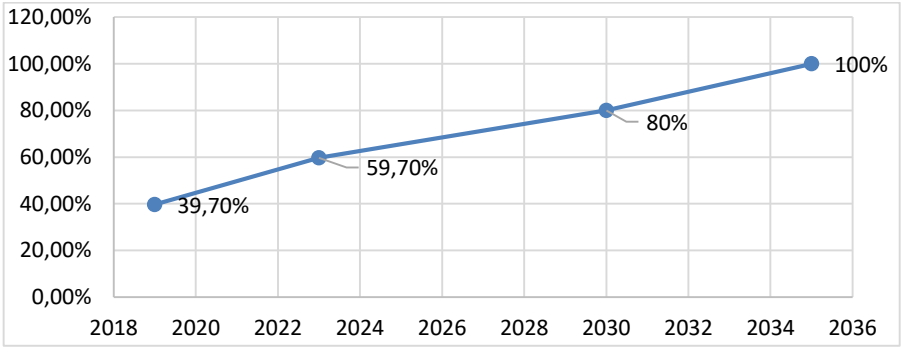

Figure 6. Share of renewable energy sources in Germany's total electricity generation. Forecast figures for 2030 and 2035.

Source: *"Fraunhofer Institute for Solar Energy Systems ISE" data was prepared by the author.*

The allocation of the initial investment by KfW and the advance guarantee that the green products produced by Feedin Tarif will be purchased are among the greatest supports for the increase in investments allocated to this area.

In the current situation, developing a green securities project with International Financial Institutions and involving these banks as investors in their issuance will serve the green growth of Azerbaijan's capital markets and economy. In the future, the establishment of the National Development Bank of Azerbaijan, along with the International Development Banks, will support the financial attraction of green projects. The German benchmark experience is one of the main experiences to be taken in this direction.

6. Studying and purposefully using the potential of the Karabakh and East Zangezur economic regions in the direction of the green economy will support the reconstruction of the lands liberated from occupation.

Goals of Azerbaijan by 2030 is "A country with a clean environment and green development". [16]Also, targets such as choosing

[16]*Azerbaijan State Information Agency "The rapid increase in Azerbaijan's renewable energy production aims to turn our country into a major exporter in this field in the region" [Electronic resource]. – URL: https://azertag.az/xeber/azerbaycanin_berpaolunan_enerji_istehsalinin_suretle_artmasi_olkemizi_bu_sahe_uzre_regionda_esas_ixracatchiya_chevirmek_meqsedi_dasiyir-2940157*

2024 as the Year of Solidarity for a Green World, declaring the liberated Karabakh and East Zangezur regions as green energy zones, and establishing "net zero emission" zones in these areas based on cooperation with the Japanese company TEPSCO, create a need to [17]improve the environment in this direction, restore and increase green areas, and promote the efficient use of water resources and renewable energy sources. In particular, it is stated that Azerbaijan aims to consistently reduce greenhouse gas emissions. One of the most noteworthy aspects is measuring the potential of our liberated territories in this regard. It can be predicted after this decree that environmental protection will be a priority in these regions and that innovative approaches such as smart cities and villages will be implemented.

Figure 4 shows the economic potential of renewable energy sources in Azerbaijan. Excluding large HPPs, the economic potential of renewable energy sources in Azerbaijan is reported [18]to be 27 GW.

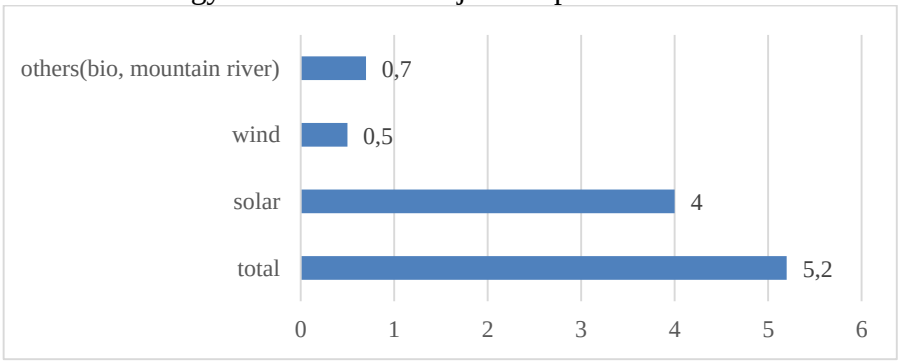

Chart 4. Economic potential of renewable energy sources in Azerbaijan, GW

Source: *Prepared by the author based on information from the Ministry of Energy*

[17]*Official website of the Azerbaijan Renewable Energy Agency under the Ministry of Energy of the Republic of Azerbaijan. [Electronic resource]. – URL: https://area.gov.az/*

[18] *Azerbaijan Republic Energy Ministry Official website – URL: https://minenergy.gov.az/*

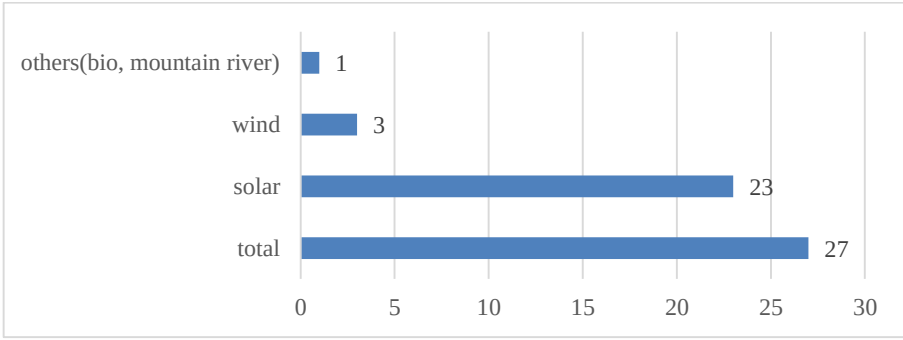

Chart 5. Economic potential of renewable energy sources in the Karabakh and East Zangezur economic regions, GW

Source: *Prepared by the author based on information from the Ministry of Energy*

Figure 5 shows the economic potential of renewable energy sources in the Karabakh and East Zangezur economic regions. It can be seen that 20% of the total renewable energy potential falls on the Karabakh and East Zangezur economic regions.

Studying the potential of the Karabakh and East Zangezur economic regions in the direction of the green economy, they can play a key role in the reconstruction of the liberated lands.

7. Taking advantage of the green financing experiences of the World Bank and regional development banks, developing green economy mechanisms, including ensuring their participation as investors in the issuance of green bonds and shares, and facilitating the development procedure of the liberated territories. will accelerate.

widespread in developed countries. Green equity indices are used in international practice. Nasdaq has a whole "family of environmental indices" called the "Green" Indices that track the clean energy sector [19]. These indices include companies that are focused on reducing carbon use and supporting economic development. The family Nasdaq Green Economy Global Benchmark Index (QGREEN) stands at the top. This index energy efficiency, clean fuel, recovery done energy production,

[19]*CEDEFOP. Future Skills Needs for the Green Economy , Research Paper // Luxembourg : Publications Office of the European Union, 2009. – [electronic resource] URL: https://www.cedefop.europa.eu/files/5501_en.pdf*

natural resources, water, pollution reduction and advanced materials like in the fields performance indicators to follow for created [20].

For the emergence of a green securities market, it is necessary to have a taxonomy of the country. The taxonomy defines the principles on which green securities should be issued and the directions in which the raised funds should be spent. The main reference source in this field is the London-based International Capital Markets Association (ICMA). According to international practice, companies formulate their own green securities guidelines in accordance with the taxonomy. Then, a second-party audit company gives its opinion on the guidelines. Finally, they are verified as green securities by a group that has the privilege of issuing green licenses. The authority to issue this license in the region is the Green Finance Center located in Kazakhstan. As they are accredited by the International Capital Markets Association (ICMA) with the right to issue a license. The Green Finance Center can both provide opinions and determine whether securities belong to the green segment. can verify. Verification After completion, the Securities are placed on the Stock Exchange through the initial trading method. International Development Banks are interested in investing according to their mandates. Examples of these include the World Bank, Asian Development Bank, European Bank for Reconstruction and Development, etc. International Financial Institutions Acting as an investor increases the confidence of other institutional and individual investors and has a positive impact on their investments in those securities.

The advantage of green equity financing over green bond financing is that companies gain healthy partners instead of borrowing and make dividend payments to those partners based on their dividend policies from the profits they earn. In this direction, companies to be established in the East Zangezur and Karabakh economic regions can attract green investment and develop their companies by issuing green shares instead of borrowing and raising finance.

[20] *Nasdaq. " Green Equity Indexes " [Electronic resource] / Nasdaq . – URL: https://www.nasdaq.com/solutions/green-equity-indexes*

CONCLUSION AND SUGGESTIONS

The main results of the dissertation research are as follows: can be summarized:

1. experiences of developed countries to achieve Azerbaijan's environmental sustainability and economic development goals. The possibility of using it has been noted.
2. assessed the environmental, economic and social impacts of green economy policies. This assessment is important for understanding the benefits and challenges that Azerbaijan may face in implementing green economy policies. The dissertation shows the positive impact of increasing state environmental spending on green business investments.
3. The study assessed the current state of the green securities market in developed countries. The important role of international development banks in the development of the green securities market in Azerbaijan was emphasized.
4. discusses the optimization of carbon emissions and environmental impacts based on Carbon Certificates and Emission Permits. The necessity of creating a Voluntary Carbon Market infrastructure for this purpose is emphasized.
5. The importance of human capital in the development of the Green Economy was noted, and the establishment of cooperation in this direction with International Standardization Institutes was noted in the current situation.

Finally, the study offers policy recommendations and strategic directions to guide Azerbaijan's transition to a green economy. These recommendations will help identify policy steps that can be implemented to improve Azerbaijan's environmental sustainability, economic growth, and social well-being.

Based on the scientific results obtained from the dissertation research, the following are proposed:

1. The main hypothesis of the dissertation is that increasing government spending on environmental protection will lead to an increase in business investments in the green economy, but the regression as can be seen from the analysis, an increase in the severity index of

environmental policy, i.e., penalty mechanisms, etc. will lead to a decrease in business investments in this area (United Kingdom experience). For this reason, in addition to the application of penalty mechanisms that are necessary for the protection of the environment, attention should be paid to increasing the expenditures allocated by the state to the environment and the green economy in general, and to ensuring that the regulatory process in this direction is carried out correctly and the golden mean principle is followed. In other words, if the expenditures allocated to the environment are formed solely on the basis of penalty mechanisms and other regulations in this direction, a serious problem may arise in attracting green business investments. How the volume and quality of taxes and state spending practices for sustainable development can be increased and the effectiveness of existing green fiscal policy practices are the subject of discussion for future research.

2. Creation of a Voluntary Carbon Market, regulation of companies' impacts on nature through a carbon credit mechanism. Implementation of carbon certificate trading on the stock exchange. In this direction, cooperation can be established with the British Standard Institution, which operates based in England (they have experience in Egypt - they supported the creation of a Voluntary Carbon Market after COP27 and the sale of carbon certificates on the stock exchange).
3. In order to develop the green securities market in Azerbaijan, amendments to the country's Civil Code were made, a green taxonomy was created, and an appropriate Framework for sovereign green bonds was established (Sovereign Green bond Framework), the formation of the legal basis of these securities in accordance with the Law on Securities , the determination of the green listing segment of the Baku Stock Exchange and the implementation of tax incentives for these securities are necessary steps. The state's financial attraction through the issuance of green bonds for projects targeting a sustainable economy will allow for the effective implementation of projects in a short time. Work can also be done in this direction for the construction of the railway line that will connect the East Zangezur Economic Region and the Nakhchivan Autonomous Republic, which is planned to be laid. It is possible that the Ministry of Finance of the Republic of

Azerbaijan will implement the project for the preparation of the Framework for Green State Bonds in cooperation with the Asian Development Bank. They have Uzbek experience in this direction.

4. The development of the liberated Karabakh and East Zangezur economic regions directly depends on the concept of green economy. The region's wealth of natural resources will lead to the operation of renewable energy sources in this area. The issuance of green shares for the development of small and medium-sized enterprises, which, along with large companies, have difficulty in borrowing, will pave the way for the creation and development of new businesses in this area.
5. Vertical farming is a way to maintain sustainability in agriculture and use resources efficiently. A project should be prepared by the Ministry of Agriculture to introduce, use and stimulate farming technologies into the country.
6. In addition to the International Development Banks, the establishment of the National Development Bank of Azerbaijan will support the financing of green projects. The German benchmark experience is one of the main experiences to be taken in this direction.
7. By implementing the transformation to a green economy on an embryonic basis, that is, in stages, we can support the mass adoption of the green economy. Initially, the widespread use of green technologies in households (on the roofs and fences of houses, etc.) will lead people to see the benefits of this area and to promote it.
8. Training and Capacity Building: The transition to a green economy requires skilled human resources. Therefore, green economy training programs and capacity building activities should be a high priority in Azerbaijan. The development of a skilled workforce in the green economy should be supported by ensuring cooperation between universities, vocational education institutions, and government agencies. Green Economy should be reflected in the textbooks of secondary and higher education institutions. As a pilot project, a new specialization program on green economy could be created at Karabakh University, located in the Green Economic Zone, and later extended to other universities.
9. During the transformation to the green economy, along with the newly trained employees (in accordance with proposal 8), taking into account

the social impacts, it is possible to ensure the transformation of the current workforce of the brown economy in order to avoid the emergence of unemployment problems, and thus prevent social problems that may arise during the transformation. In this regard, the state should develop incentive programs for companies to conduct special training for their employees (for example, state support for payments related to the training to be held).

The main scientific results and provisions were published on the following scientific articles and abstracts:

1. Abbaszade F.Kh. MODELS OF "GREEN" ECONOMY AND ENSURING SUSTAINABLE ECONOMIC DEVELOPMENT / XIV International scientific and practical Conference « Mechanism implementation strategy social-economic development Gosudarsta », Makhachkala – 2022. – 7-12 c.
2. Abbaszadeh FX "Green economy" as a new entrepreneurial model / Scientific and practical journal of labor and social relations, 2022. – No. 1 (21). – pp. 94-99.
3. Abbaszadeh FX Green economy: “New concept and new investment model” / Scientific and practical journal of labor and social relations, 2022. – No. 2 (20). – pp. 148-154.
4. Abbaszade FX Systematic implementation of measures and development policies in the field of green economy / Economic Reforms scientific-analytical journal, 2022. – No. 4 (5). – pp. 51-58.
5. Abbaszadeh F. Green economy prospects: analysis of structural approaches and fiscal policy / F. Abbaszadeh, A. Satici ; – Economic Reforms, 2023. – 8. – pp. 25-32.
6. Abbaszade FX Green economy as a new model in the development of society / Economic Growth and Social Welfare, 2023. – No. 4. – pp. 111-117.
7. Abbaszadeh FX The role of the sustainable development concept in the green economy / Materials of the XXVI Republican Scientific Conference of Doctoral Students and Young Researchers. Baku, November 17-18, 2023. – pp. 379-383.
8. Ensuring “sustainable development” during the transition to a new

green economy / Materials of the II International Scientific Conference “Sustainable development strategy: global trends, national experiences and new goals”. Mingachevir State University, December 8-9, 2023. – pp. 390-392.
9. In Abbaszadeh Farid Khalik sons , meaning transition on green economy and politics sustainable economic развития , – Финансовая economy 2024. No. 2, – pp . 105-109
10. Abbaszade FX Cooperation and technical support projects of the EEC in the field of green economy building in Azerbaijan / VII Republican Scientific Conference of Young Researchers, March 15, 2024. – pp. 15-1

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