Bieliaieva N., Bay S. Green jobs and education: analytics and paradoxes. *Zovnishnja torgivlja: ekonomika, finansy, pravo*. 2022. № 2. S. 52-63. Serija. Ekonomichni nauky. https://doi.org/10.31617/zt.knute.2022(121)05

UDC 331.5+378.147=111

DOI: 10.31617/zt.knute.2022(121)05

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GREEN JOBS AND EDUCATION: ANALYTICS AND PARADOXES

Introduction. *Implementation of the of green economy model involves creating conditions for business development based on a new environmental standards and technologies, state support for socially and environmentally responsible enterprises, increasing the role of the state and intergovernmental bodies in economic and environmental culture, environmental initiatives and resources, resource conservation programs. Identification and environmental vacancies that diversify energy sources, sustainable development, energy supply, address the environmental and health issues, help leaders and policymakers identify and provide executive decisions and identify multifaceted priorities for environmental management.*

Problem. *To achieve this goal, it is necessary to determine the priority areas for innovative development of public policy, based on the priority of implementing international and European economic standards as at present, the institutional principles for green growth in Ukraine have not yet been finalized.*

The aim *of the article is to investigate the main issues about green jobs in education as well as green economy and find paradoxes of its implementation.*

Methods. *The information basis for the study is the latest work of scientists in a particular field. System analysis, synthesis, analysis have been used.*

ЗЕЛЕНІ РОБОЧІ МІСЦЯ ТА ОСВІТА: АНАЛІТИКА ТА ПАРАДОКСИ

Вступ. *Впровадження моделі зеленої економіки передбачає створення умов для розвитку бізнесу на основі нових екологічних стандартів і технологій, державну підтримку соціально та екологічно відповідальних підприємств, підвищення ролі держави та міждержавних органів в економічній та екологічній культурі, екологічних ініціативах і ресурсах, програм ресурсо-збереження. Ідентифікація та екологічні вакансії, які диверсифікують джерела енергії, сталий розвиток, енергопостачання, розв'язують проблеми довкілля та охорони здоров'я, допомагають лідерам і політикам визначати та надавати виконавчі рішення та визначати багатоаспектні пріоритети екологічного менеджменту.*

Проблема. *Для реалізації зазначеної мети необхідно визначити пріоритетні напрями інноваційного розвитку державної політики, виходячи з пріоритетності впровадження міжнародних та європейських економічних стандартів, оскільки на цей момент інституційні засади зеленого зростання в Україні ще не остаточно сформульовані.*

Метою *статті є дослідження зелених робочих місць в освіті, а також зеленої економіки та знайти парадокси їх впровадження.*

Методи. *Інформаційною основою дослідження є новітні роботи вчених у певній галузі. Використано системний аналіз, синтез, аналіз.*

The authors contribute equally.
The authors of the manuscript did not receive direct funding in the preparation of the manuscript.

Results. *It is determined that green jobs means presenting jobs aimed directly at protecting the environment or which connected with minimization of humans' impact on the planet existence. It is presented green jobs in different fields of activity with the formulation of their peculiarities. It is determined new professions related to the development of the green economy. It is investigated the concept of a green workplace, new skills that are important for green jobs and education. New requirements (skills) for new professions are also studied.*

Conclusions. *All developed countries are working in the direction of planet saving, as well as the green economy. Green projects could receive much more funding if investors had more reliable information about the projects and their participants. Potential investors are deterred by the lack or fragmentation of information on how the proposed projects will affect (or may affect) the state of the environment, if this may affect such an income.*

Keywords: green economy, green jobs, environmental vacancies, education, protecting the environment, green workplace, planet saving, sustainable development

Результати. *Визначено, що зелені робочі місця представляють собою робочі місця, спрямовані безпосередньо на захист довкілля або пов'язані з мінімізацією впливу людей на існування планети. Представлені зелені вакансії в різних сферах діяльності з формулюванням їх особливостей. Визначено нові професії, пов'язані з розвитком зеленої економіки. Досліджено концепцію зеленого робочого місця, нових навичок, які важливі для зелених робочих місць та освіти. Також досліджено нові вимоги (навички) до нових професій.*

Висновки. *Розвинені країни працюють у напрямі збереження планети, а також зеленої економіки. Зелені проєкти могли б отримувати набагато більше фінансування, якби інвестори мали достовірнішу інформацію про проєкти та їхніх учасників. Потенційних інвесторів стримує відсутність або фрагментація інформації про те, як запропоновані проєкти вплинуть (або можуть вплинути) на стан довкілля, якщо це може вплинути на такий результат.*

Ключові слова: зелена економіка, зелені робочі місця, екологічні вакансії, освіта, захист навколишнього середовища, зелене робоче місце, збереження планети, сталий розвиток

JEL Classification: O13, O44, Q56

Conflict of interest. The authors certify that they have no financial or non-financial interest in the subject matter or materials discussed in this manuscript; the authors have no association with state bodies, any organizations or commercial entities having a financial interest in or financial conflict with the subject matter or research presented in the manuscript. The authors are working for the institution that publishes this journal, which may cause potential conflict or suspicion of bias and therefore the final decision to publish this article (including the reviewers and editors) is made by the members of the Editorial Board who are not the employees of this institution.

Introduction. Green economy is one of the key targets of the 2030 Agenda for Sustainable Development. The European Union (EU) has now announced the European Green Deal. Europe has already linked its future with green jobs and technology. Opportunities to create millions of green jobs are an answer and a result of transition to a decarbonised economy, which is environmentally friendly, – and the circular economy, which involves reusing, repairing or recycling, increasing sustainable manufacturing and consumption. However, February 2022, as the beginning of Russia's military offensive against Ukraine, radically changed the rules of doing business. The main goal is to stimulate business to work in wartime in Ukraine and to provide jobs for immigrants from Ukraine in other countries. It is observed transferring production to a territory where there is no war. In such circumstances, in particular, when creating new jobs, it is necessary to take into account the capabilities of the host economy, and the potential for «greening» new working places (jobs).

Especially in the face of a staggering burden on the nearest world's stable economies due to the reception of migrants from Ukraine, the social

component of a green economy is stable employment trends. Today, there is a growing trend in employment in areas related to the protection of biological diversity of resources, environmental protection, restoration of natural resources, as well as the provision of environmental services.

Problem. In Ukraine, information about the size of the green business is not clear and is very difficult to calculate. At the same time, for the successful functioning of «green» business in Ukraine, its state stimulation is needed, and not vice versa, when environmentally harmful industries such as coal mining and metallurgy are subsidized from the state budget. Businesses need cheap loans and tax breaks to start a green business. In addition, it is important to increase the environmental tax, create an appropriate regulatory framework and standards, make transparent the system of energy pricing and tariffs. These proposals will encourage companies to use green technologies in their activities, which will, inter alia, increase the competitiveness of domestic goods on the world market.

At present, the institutional principles of green growth in Ukraine have not been finalized, so it is crucial to determine the priority areas of innovative development of public policy, based on the priority of implementing international and European economics standards.

Analysis of recent research. The United Nations Environment Program (UNEP), the International Labor Organization, the International Organization of Employers and the International Trade Union Confederation are jointly implementing the Green Jobs Campaign [3]. The campaign supports the concerted efforts of governments, employers and trade unions to develop and implement in a climate-dependent world, environmentally sustainable and coherent policies and effective programs to create environmentally friendly jobs and promote decent work for all. Green jobs also become popular due to principles of the green recovery that is the part of the main political projects in the European Union. The European Union (EU) has now announced the European Green Deal [4]. Europe has already linked its future with green jobs and technology. Twice as many people work in this area as in the automotive industry. Indeed, it is thanks to this approach that the consumption of electricity, water, raw materials is reduced, the emission of greenhouse gases and production waste is reduced, the ecosystem and biodiversity are preserved [5].

The scope of the study is to investigate the main issues about green jobs as well as green economy and find paradoxes of its implementation.

Methods. The information basis for the study is the latest work of scientists in a particular field. *System analysis* has been used to understand what is green economy and green jobs are, how globalization changes influenced economy development. Using *synthesis*, a number of conclusions were made to create a clear concept of green jobs formation. Using the *analysis*, a logical sequence of factors and their interrelationships was

established within the entire green economy model under nowadays circumstances. Identified elements indicate the directions of changes that need to be implemented while green economy model implementation.

Results of the research. Talking about green jobs means presenting jobs aimed directly at protecting the environment or which connected with minimization of humans' impact on the planet existence (*Figure 1*). Green jobs connected with any jobs that have a direct and positive impact on the planet, that influence on formation of a low carbon economy of the future, as they strive for unemployment level reducing and prevention of the environment degradation. The economy should urgently be redesigned so that resources aren't wasted.

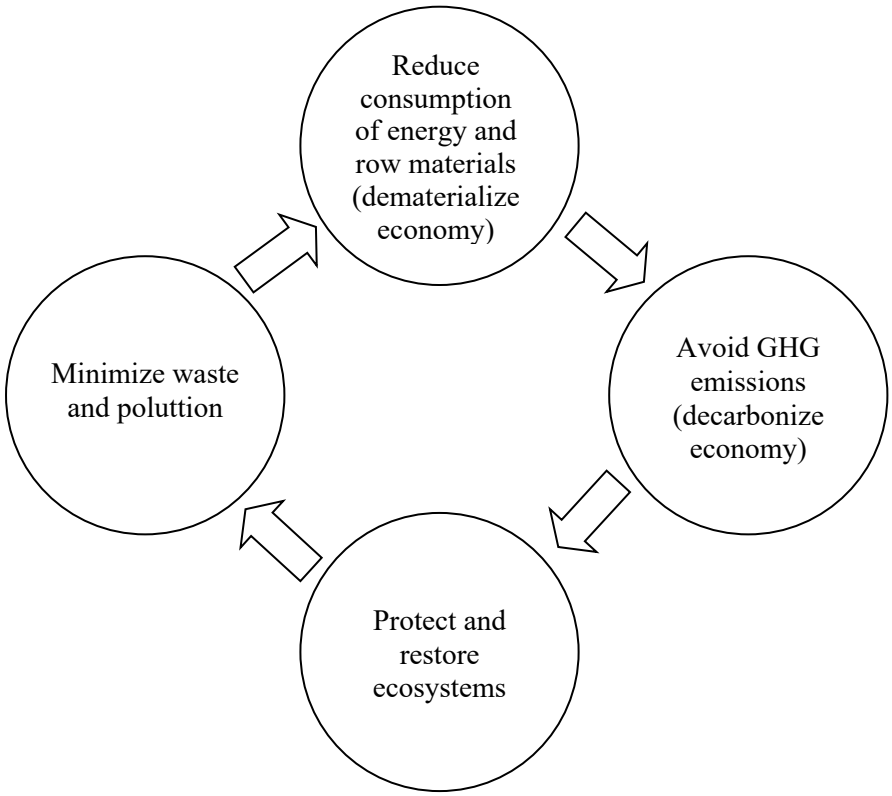

Figure 1. Green is the link between the environmental movement and sustainability

Source: created by the author on the base of [3; 5].

According to the International Labour Organization (ILO) green jobs: limits greenhouse gas emissions; protects and restores ecosystems; improves energy and raw materials efficiency; minimizes waste and pollution; contributes to adaptation to climate change. Green jobs are also connected with ecological employment that is a new type of employment associated with the elimination of accumulated damage, disturbed land, processing of solid waste, the introduction of environmental innovations, etc. So benefits impress.

Green jobs cover a wide range of professional activities, crafts and specialties (*Figure 2*).

Some of them represent completely new types of work, but most are traditional professions, although with small changes in the essence of the content and attitude to the work itself. Creation of a green jobs in different fields of activity requires different peculiarities (*Table 1*).

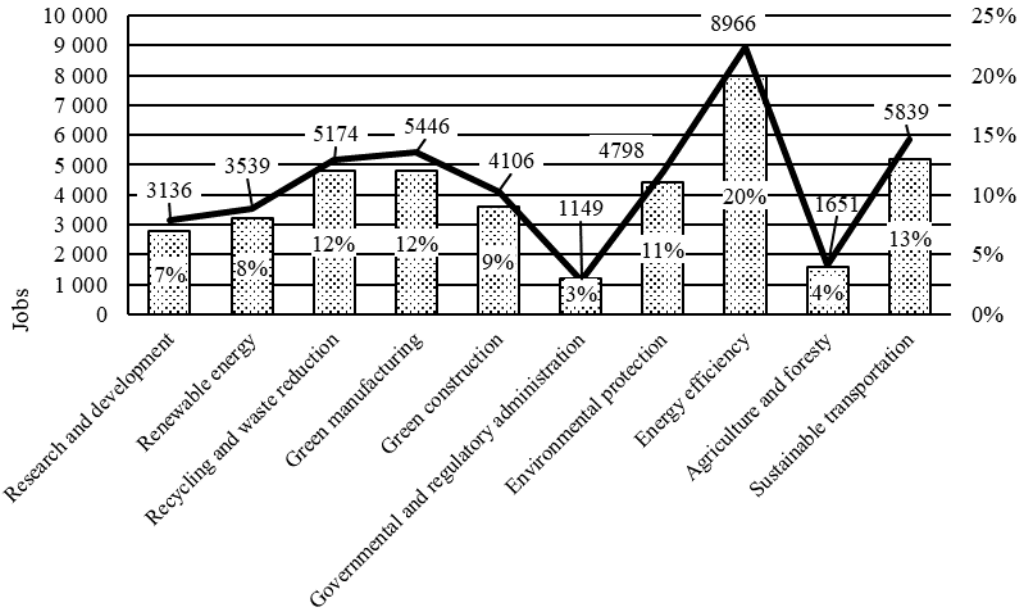

Figure 2. Green job activities statewide

Source: created by the author on the base of [3; 5].

Table 1

Peculiarities of green jobs creation in a different fields of activity

Field of activity	Ways to create green jobs
Agricultural sector	introduction of organic farming methods, development of rural infrastructure (roads, access to water and modern energy sources), green tourism
Food	introduction of eco-labelling; development of organic agriculture
Forest sector	reforestation and afforestation activities, creation of green zones in urban agglomerations, landscape projects, soil reclamation
Fisheries sector	fish farming, fish and seafood processing, application of aquaculture technologies to reduce water pollution, recreational programs
Energy sector	use of renewable energy sources (solar, wind, bioenergy)
Industrial sector	introduction of resource-saving technologies and processes, focus on closed cycle production (incl. recycling), use of waste instead of primary raw materials, modification / repair of finished products
Social sector	adaptation of the economy and population to climate change; increasing the energy efficiency of housing; formation of a system of sustainable consumption
Recycling	collection, sorting and recycling, recycling of consumer electronics (computers, mobile phones and other devices - so-called e-waste)
Construction	renovation of existing and construction of new buildings using modern, environmentally friendly technologies, processes and materials

Field of activity	Ways to create green jobs
Transport	development of public transport, use of alternative fuels and transport, improvement of infrastructure
Financial sector	formation of the carbon market; «green» procurement; «green» electricity tariffs
Services	eco-audit, consulting, design, research and development; sale, installation and maintenance of eco-goods

Source: created by the author on the base of [3; 5].

Of course, it's not a full list – but still – a new paradox – no proposed positions in educational sphere. New professions looks like that (*Table 2*).

Table 2

New professions related to the development of the green economy

Category	New types of positions
Management / Entrepreneurship	Renewable energy manager
	Green business manager
	Forestry/land manager
	Recycling and waste manager
	Energy auditing
	Solar energy entrepreneurs
Technicians	Solar panel technicians
	Waste recycling technicians
	Technology installers
	Wind power technicians
	Biofuel technicians
	Energy consultant in low carbon economies
	System mechanics
	Wave power workers
	Clean car mechanics
	Water quality technicians
Builders	Green housing builders
	Green commercial builders
	Eco-friendly furniture builders
	Retrofitters
Engineers and designers	Electric car engineers
	Renewable energy engineers
	Shipbuilding to wind turbine manufacture
	Green urban planning
	Eco-friendly landscaping design
Scientists	Marine biologist
	Climate researchers
	Geologists
	Botanists and horticulturalists
	Police advocates and regulators

Source: created by the author on the base of [3; 5].

All researches, including International Labour Organisation, shows that traditional jobs decreases, but however in some spheres it's shows a huge potential for a new jobs' formation. However – as well as in renewable energy sphere there is going to be increasing of jobs to 2050, so prognosed rated are incredible (*Figure 3*). Decarbonizing energy will create millions of renewable energy jobs.

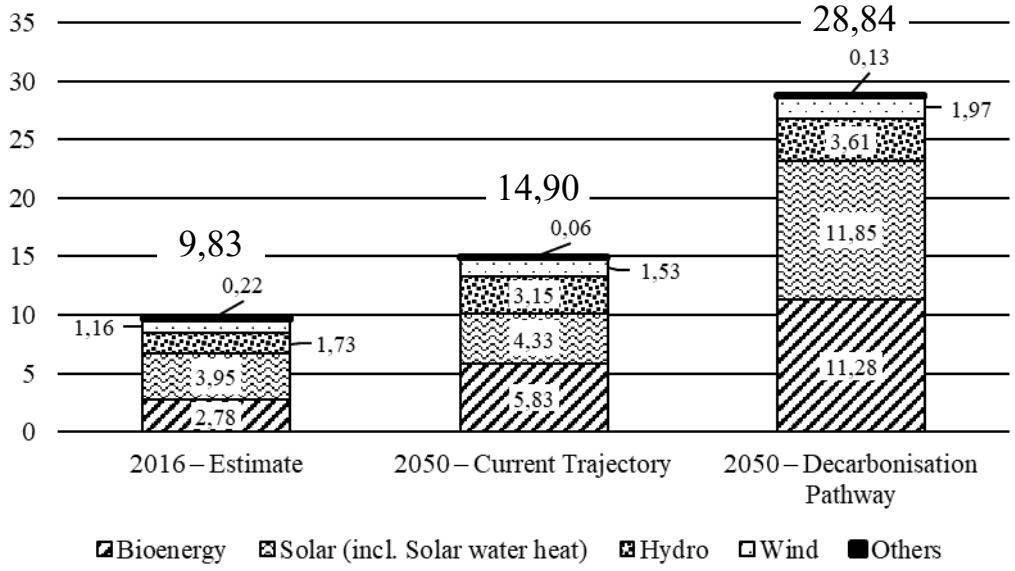

Figure 3. Potential in the green job creation sector

Source: created by the author on the base of [3; 5].

The green economy today costs as much as the fossil fuel sector, but offers more significant and 'safe' investment opportunities. Today, the green economy accounts for 6% of the world stock market (about $ 4 trillion), which 'works' in projects of 'clean' energy, energy efficiency, water supply, waste management and more. If the sustainable economy maintains its current course and development trends, as well as about $ 90 trillion of 'green' investments are invested, then in 2030 it will form about 10% of the world market value.

Concept of the green workplace

Anyway, the concept of a «green» workplace is not absolute, as there are different «shades» of green, within which there are thresholds on which the degree of environmental health depends. For example, a worker who is installing sustainable wood flooring in a building is engaged in a green job even if the rest of the construction project is not environmentally sound. However, a worker who is using conventional materials and methods to shingle a house or pouring concrete in a traditional way is not performing a green job, even if the overall construction project racks up enough credits to qualify as «green». Just because a building as a whole is considered «green» does not mean that every single job on that project is also green by association. That's the point:

- jobs at the enterprise that produces environmental goods/services (green products), but the production process and technology are not always environmentally friendly;
- jobs at the enterprise that uses environmentally friendly technologies and processes (green technologies, processes), but its products/ services are not necessarily environmentally friendly;
- from the point of view of the International Labour Organization, in any case, jobs can be considered green if they also meet the criteria of decent work.

Green jobs and education. New skills

Let's go again to green jobs and education. Talking about green – like 'E' in a word green means sustainability trends:

- Generating renewable energy
- Recycling existing materials
- Energy efficient product manufacturing, construction, installation, and maintenance
- Education, compliance, conversation, and awareness
- Natural and sustainable product manufacturing

Nowadays society requires people who can create value in line with societal needs and planetary boundaries. So, based on international experience, it can be argued that the transition to a green economy transforms the qualitative characteristics of employment. Thus, according to studies by foreign scientists, green workplaces require workers to have a higher level of education, work experience and highly qualified professional training in comparison with those employed in non-green workplaces (*Figure 4*).

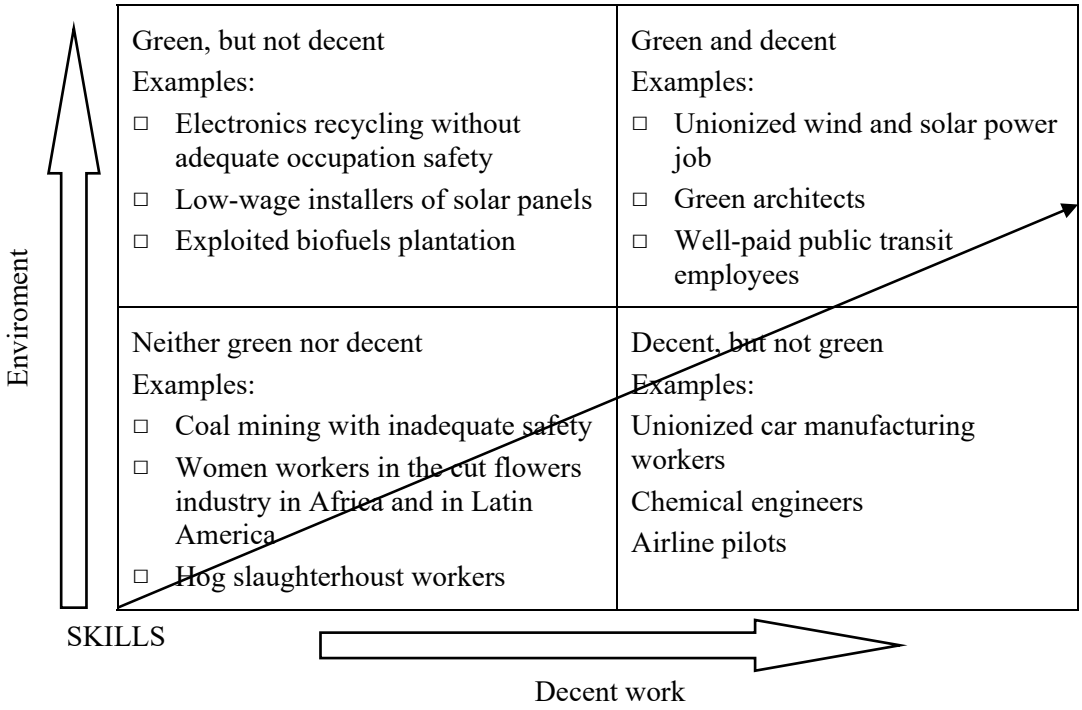

Figure 4. Green jobs and decent work

Source: created by the author on the base of [3; 5].

Integrating green skills into existing qualifications through specialization or diversification is generally more effective than creating new occupations. And here we need to talk not only about hard skills, but also and soft ones. And one of the main points – employees need to use them both, in a complex, but not separately. So, ten Competencies Needed to be successful in environmental work, are listed below:

1. Communication skills
2. Collaboration, bridge-building abilities
3. «Customer» orientation
4. Creativity/innovative thinking
5. Broad environmental sciences understanding
6. Analytical ability, critical thinking, problem-solving
7. Work orientation, professionalism, positive attitude
8. Occupation-specific skills and knowledge
9. Mastery of informational technology
10. Leadership ability.

Example of upskilling to new occupations (*Table 3*) – with a help of a combinations of new skills. There were cleaners and service personnel – became service and logistics managers, were electricians – became information technology experts, were masons – became architects, were loan clerks – became investment managers: people in the workplace at all levels will see how the content of work changes, its implementation and requirements for new professional skills.

Table 3

Upskilling to new occupations

Occupation	Training	Up skilling	New occupation
Energy technologist	Vocational/tertiary engineering qualification	Knowledge of energy sources to integrate energy systems, project management	Manager in renewable energy
Industry electrician	Vocational upper secondary qualifications	Assemble, installation of parts, use of tools	Wind turbine operator
Plumber/electric and heating installer	Basic vocational training	Technical training, administration and entrepreneurship skills	Solar energy entrepreneur, installation project designer
Engineer in energy sector	Tertiary engineering qualifications	Installation and maintenance of low carbon technology	Smart Energy Expert

Source: created by the author on the base of [3; 5].

At the same time, based on international experience, it can be argued that the transition to a green economy changes the qualitative characteristics of employment. Thus, according to research by foreign scientists, environmentally friendly jobs require workers with a higher level of education, work experience and highly qualified training compared to those who work in green jobs [4]. For example, the Finnish company Paptic, which employs only 10 people, has developed an environmentally friendly technology for the production of easily recyclable packaging paper based on cellulose and bioplastics, replacing conventional polyethylene [15].

The global eco-trend, which covers all spheres of modern life, has not gone unnoticed by the working environment of office-type organizations, embodied in the concept of «green office», which has become a calling card of many leading companies and is gaining popularity [5]. The Green Office is an environmentally responsible office that most efficiently uses the natural resources necessary for its work, constantly taking care of reducing its own negative impact on the environment (reducing the consumption of water, energy and other resources); clarification of the amount of waste when working in offices; replacement (processing) – the purchase of goods and services that minimize the impact on the environment, promote more efficient use of transport for personal and business purposes, etc.

Conclusions. All developed countries also work in the direction of planet saving, so green economy as well. In Spain, for example, the Government has proposed a Climate Change and Energy Transition Law that aims to achieve climate neutrality by 2050 and incorporates ambitious intermediate targets for emissions, renewables and improved energy efficiency [4]. The UK industry will also receive £350m investment to cut carbon emissions in sectors such as transport and construction. By comparison, France is planning to invest one third of its €100bn (£90bn) post-Covid economic stimulus on greening the economy – more than any other big EU country – but critics insist that even this falls short of what is necessary for a step change. Germany's €130bn recovery budget focuses on climate-friendly industries and aims to support green infrastructure and technologies with at least €40bn spending in this area. Investing in forest conservation and restoration could increase formal employment alone by 20% by 2050. For transport, improving energy efficiency in all modes of transport and switching from private transport to public or non-road transport would further increase employment by about 10%. Finally, investments in energy efficiency improvements in buildings and structures could create only in Europe and the USA 2 – 3.5 million additional work places. For now, 19.4% of US workers could currently be part of the green economy in a broad sense, although a large proportion of green employment would be 'indirectly' green, comprising existing jobs that are expected to be

in high demand due to greening, but do not require significant changes in tasks, skills, or knowledge [5]. And Denmark, one of the greenest countries in the world, has created 300,000 green jobs over the past 2 years. Mainly in factories producing wood windows, insulation materials, thermostats and pumps that reduce energy consumption. For example, within the framework of the Smart City Fied project, such residents of the Spanish city of Laguna de Duero were involved in refurbishing buildings and increasing their energy efficiency. After completing a simple training course, they quickly mastered the installation of solar panels on the roofs of houses, and started servicing charging stations for electric cars

At the same time, the potential for «green» investment and the use of these instruments on a much larger scale is still limited. Green projects could receive much more funding if investors had more reliable information about the projects and their participants. Potential investors are deterred by the lack or fragmentation of information on how proposed projects will affect (or may affect) the state of the environment, what is the cost-benefit ratio, given that such projects are usually long-term.

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The article has been received by the editors on 14.02.2022.
The article has been accepted for publication on 01.03.2022.
Online publication 22.04.2022.