


# THE IMPACT OF GREEN JOBS ON THE IMPLEMENTATION OF THE EUROPEAN UNION CONTEMPORARY DEVELOPMENT CONCEPTS. SELECTED ISSUES

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***Abstract:** The evolution of modern concepts of the European Union (EU) development increasingly takes into account the aspect of environmental protection. At the same time, new development theories set ever higher standards in the field of environmental standards. The article presents the main development concepts of the European Union (sustainable development, circular economy, green economy, green growth and The European Green Deal), as well as the resulting main guidelines for environmental protection. The aim of the article is to show the importance of green jobs as one of the key factors in implementing the assumptions of the aforementioned EU development concepts. This significance was expressed as a relationship between green jobs and the implementation of circular economy assumptions in the area of waste management (economic dimension), as well as their impact on the quality of life of residents (social dimension). The analysis used statistical data on the employment structure in the EU countries, the efficiency of their circular economy, the level of their innovation and data from specialist studies on the assessment of the quality of life according to the adopted measure. As part of the research methods, the collected data were compared and the relationships between them in the form of correlation coefficients were examined. As a result of the conducted research, a positive correlation was observed between the share of green jobs in the employment structure of individual EU countries and the effectiveness of their relation to the circular economy assumptions, the level of their innovativeness and the quality of life of their inhabitants. These results indicate the legitimacy of creating green jobs as a factor in the implementation of the socio-economic development of the EU in accordance with modern concepts functioning in this area, with particular emphasis on the European Green Deal.*

**Key words:** green jobs, ecological innovations, quality of life, European Green Deal,

**JEL codes:** Q01, Q50, Q51, Q52, Q55

## 1. Introduction

In the contemporary socio-economic development of the European Union, one can notice the increasing importance of environmental issues. This is accompanied by a growing public awareness of the environmental limitations of natural resources, the state of its pollution and its impact on the quality of life. This situation implies taking action to minimise the consumption of natural resources and looking for new technological solutions which could make the economy independent of such raw material limitations, reduce pollutant emissions as well as improve the condition of the environment by removing the waste deposited in it. These activities are regulated and supported in the European Union by a number of directives setting out economic development strategies, taking into account environmental issues, which are in line with accepted concepts of socio-economic development.

### 1.1. Contemporary concepts of EU development

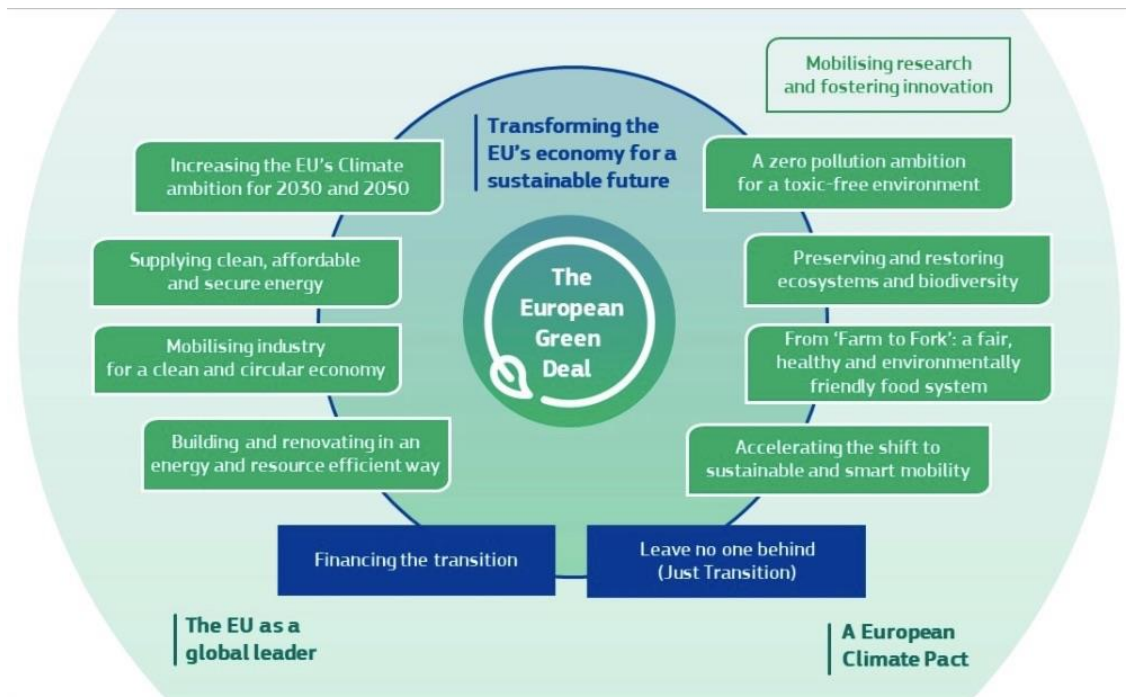
One of the most recent development concepts of the EU is the European Green Deal, which assumes achieving a state of development in which economic development is environmentally neutral. In the face of climate change, pollution and resource consumption, the vision of the European Green Deal points to the need to continue to grow in a way that transforms the European Union into a modern, resource-efficient and competitive economy. Thus, the goal of such growth is to become environmentally neutral economy, where:

- net zero greenhouse gas emissions will be achieved in 2050,
- there will be a decoupling of economic growth from resource consumption,
- no individual as well as no region will be left behind (European Commission, 2019).

This orientation indicates that environmental issues are now prioritized in development strategies (Eckert & Kovalevska, 2021).

The main elements of the European Green Deal are shown in Fig. 1

**Fig. 1** European Green Deal



Source: European Commission, 2019

The assumptions of the European Green Deal can be considered as a kind of reaction to the assessment of the current state of the natural environment, and at the same time to designate actions aimed at its improvement. Thus, the main activities indicated in this concept include:

- a) "increasing the EU's climate ambition for 2030 and 2050", which means the need to introduce a single climate law that will enable the achievement of energy efficiency by 2050.
- b) "supplying clean, affordable and secure energy" - as 75% of greenhouse gas emissions in the EU come from energy production and generation, it is necessary to switch to renewable energy sources and increase energy efficiency
- c) "mobilising industry for a clean and circular economy", which means transforming all sectors of the economy into a circular economy
- d) "building and renovating in an energy and resource efficient way", which includes, inter alia, activities aimed at improving the energy efficiency of buildings
- e) "accelerating the shift to sustainable and smart mobility" - which concerns the minimization of greenhouse gas emissions generated by transport and increasing the role of rail and inland waterways

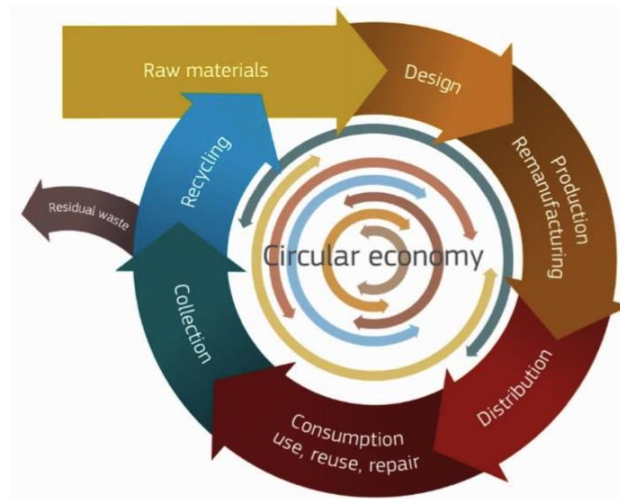
- f) "from 'Farm to Fork': designing a fair, healthy and environmentally-friendly food system " - which concerns the reduction of pollution generation and minimization of used natural resources for food production
- g) "preserving and restoring ecosystems and biodiversity " - which concerns the integration of all EU policies towards the conservation and restoration of natural capital
- h) "a zero pollution ambition for a toxic-free environment " - which means preventing the generation of new pollutants and measures to minimize and eliminate existing pollutants (European Commission, 2019).

The presented concept of the European Green Deal can be considered as the broadest approach to the current ideas of economic development, which take into account environmental aspects. It is worth noting that so far many concepts of economic development taking into account environmental issues have been created, the assumptions of which are still valid and present in the assumptions of the European Green Deal. They assume the interaction of the economy with the environment and indicate that this development should not take place at the expense of the environment.

One of such concepts is the so-called sustainable development, whose main assumption is social and economic development, in which the main importance is to improve the quality of life of current and future generations and symbiosis with the environment taking into account its resources. In other words, sustainable development means the ability to reconcile the material needs of present and future generations and the need to protect the environment and its resources. It is worth noting that the assessment of quality of life is considered here in terms of the state of the environment. It is also worth stressing that transforming the EU economy for a sustainable future is one of the watchwords of the European Green Deal.

The circular economy can be regarded as a development, or a refinement, of the concept of sustainable development. The idea puts even more emphasis on environmental protection. This theory assumes multiple processing and thus more efficient use of natural resources, while minimizing the generation of harmful emissions. This means that waste from one production process becomes raw material in another process, thus reducing the consumption of raw materials of natural origin and allowing for their natural recovery. It is worth emphasizing that transformation to such an economic model is one of the main assumptions of the European Green Deal.

**Fig. 2.** The circular economy model



Source: Commission to the European Parliament et al., 2014

According to the presented figure, the activities should, on the one hand, focus on maximizing the efficiency of the use of raw materials, while minimizing their "extraction" from the environment, and on the other hand - on limiting the "production" of residual waste. The main area determining the implementation of the idea of circular economy is waste management, within which the following priorities of activities in the field of waste management are indicated:

- prevention,
- preparing for re-use,
- recycling,
- other recovery methods, e.g. energy recovery,
- disposal (European Parliament and Council of the European Union, 2008).

The effectiveness of the implementation of actions according to the guidelines presented, is subject to continuous monitoring in the context of the evaluation of the effectiveness of waste management (Pires & Martinho, 2019). It is worth noting that, in the field of waste management, many regulations and guidelines have been developed within the European Union, setting out specific standards, e. g. in the field of waste management:

- increase the reuse and recycling of municipal waste to at least 70 % by 2030,
- achieve a packaging waste recycling rate of 70% by 2025 and 80% by 2030,
- a ban on landfilling recyclable waste (plastics, paper and cardboard, glass, metals and biodegradable waste) from 2025 (Commission to the European Parliament et al. , 2014).

In addition, the level of preparing for re-use and recycling of municipal waste is expected to be increased by weight to a minimum of 55% in 2025, 60% in 2030 and 65% in 2035 (European Parliament and Council of the European Union, 2008).

The above examples prove the high pace of intensification of activities in the field of economic development carried out with respect for the natural environment, or in other words, which would not be invasive to the environment. This is in line with the concept of the so-called green economy, which additionally takes into account social issues. This concept points to the economical management of resources, which means such an increase in social welfare that does not lead to an increase in resource consumption and degradation of the natural environment. In other words, the green economy identifies a type of economic development that results in an improvement in the quality of life and social equality while reducing environmental risks and ecological shortages [UNEP, 2010]. This type of activity is therefore consistent with the assumptions of sustainable development, which emphasize that the quality of life of future generations depends on the current activity in the field of limited consumption of resources and environmental protection. In addition, the idea of a green economy fits into the concept of the so-called green growth.

The idea of green growth assumes the rational use of environmental capital, minimizes the formation of pollution and also supports the improvement of social welfare by building a green economy and enables the achievement of sustainable development in the long term. In other words, its main message boils down to such economic growth, which at the same time enables the achievement of a significant level of environmental protection. This is also confirmed in the definition of the Organization for Economic Cooperation and Development (OECD), where green growth is defined as a way to strive for economic growth and development, while counteracting environmental degradation, loss of biodiversity and unsustainable use of natural resources " (OECD, 2010). It is worth noting that the implementation of green growth understood in this way represents a kind of economic development that does not mean exerting pressure on the environment. Therefore, at present, the European Green Deal could be considered as the end point of the above-described green growth objectives, which seems to be the most comprehensive approach to the existing concepts of economic development, taking into account the environmental aspect, and at the same time incorporating their main assumptions.

## 1.2 Green jobs

It is worth noting that an indispensable element accompanying the implementation of contemporary development ideas taking into account environmental protection are the so-called green jobs. According to the International Labor Organization (ILO), these are jobs that contribute to reducing the demand for energy and raw materials, eliminating greenhouse gas emissions, reducing waste and pollution, as well as restoring natural ecosystems (ILO, 2011). On the other hand, according to the United Nations Environment Program (UNEP), green jobs are defined as jobs "... in agriculture, production, research and development, administration and services, contributing significantly to preserving or restoring the quality of the environment. This is especially true for jobs that help protect ecosystems and biodiversity; reducing the consumption of energy, materials and water (...), decarbonising the economy and minimizing or completely avoiding the formation of all forms of waste and pollution" (UNEP, 2008). Thus, the creation of green jobs is assigned the role of preventing environmental degradation (Kyungho et al., 2021). The definitions of green jobs presented above are quite general, which may create some interpretation difficulties in the context of the possibility of their quantification and division of jobs into "green" and "non-green" ones. Therefore, attempting to define green jobs involves adopting a narrower or broader research approach. On the one hand, green jobs can be considered to be those that occur in specific sectors of the economy, and on the other hand, assume that they can occur in any sector. Thus, regardless of how it is defined, green jobs can be considered in two approaches, as directly and indirectly related to environmental protection. In the first case, it may concern jobs in e. g. enterprises collecting, sorting or processing waste, as well as institutions dealing with environmental protection. In the second case, it can mean workplaces where the area of activity is, for example, the development of new technologies, products or services that are more environmentally friendly (e. g. due to better energy efficiency, easier recycling, etc. ). Confirmation of this case is the function attributed to green workplaces of creating a new dimension of farming by linking them to eco-efficient, modern technologies of the future. This shows the link between green jobs and green innovation. This relationship is also confirmed in research conducted by the U. S. Bureau of Labor Statistics (BLS), where green jobs look at positions where workers are involved in developing manufacturing processes that are more environmentally friendly and use fewer natural resources (www1). The improvement of these production processes in the context of environmental impact can thus lead to the development of modern technological solutions in the form of eco-innovations that can support the implementation of the circular economy.

Based on the description of the determinants of contemporary EU development concepts with particular reference to the European Green Deal, it can be deduced that green jobs are a factor supporting their implementation on several levels. On the one hand, they have a direct impact (in its broader sense) on the development of innovation, which influences the achievement of ever higher environmental standards in the circular economy (waste management guidelines), which constitutes the economic dimension of their impact. On the other hand, creating green jobs influences the quality of life, which indicates the social dimension of their impact. It is worth noting that the impact on the quality of life occurs in two ways - firstly, work itself is a factor affecting the quality of life, and secondly, green jobs affect the environment, which is also one of the elements determining the quality of life. This study is an attempt to answer the question in which areas and to what extent green jobs contribute to the implementation of the above mentioned EU development concepts.

### **1.3 Green skills**

When describing green jobs, it is worth noting that their creation is significantly related to the functioning of the so-called green skills. These include ecological knowledge, skills and environmental attitudes (Subramanian et al., 2016) (Manika D. et al., 2015). Green competences are defined as skills needed to adapt products, services and processes to climate change and related environmental requirements and regulations (OECD / Cedefop, 2014). Based on the earlier definitions, it can therefore be indicated that green skills are closely related to green jobs. Thus, this "ecological orientation" justifies its inclusion in the competences of positions within green jobs. Green jobs, together with green skills, are among the key factors supporting environmentally sound economic development concepts, including the European Green Deal, at every stage from conception to implementation. It seems that a natural consequence of an increase in the "environmental consciousness" of society is the development of both green jobs and green skills. At the same time, it can be assumed that, in addition to the creation of new green jobs, there is also an increasing process of the so-called "greening" of existing jobs, i. e. the adoption by existing jobs of the characteristics of green jobs according to the adopted definitions.

## **2. Methodology and Data**

Depending on data availability in EU countries, the scope of the study covers the period from 2009. The research methodology includes a multi-threaded comparative analysis and an



analysis of the relationships between individual categories of employees in the green jobs sector, both in partial terms, including smaller categories, such as waste management, and in general terms. The data covered by the research comes mainly from statistical collections (www2, www3, www4, www5), as well as specialist studies (www6). Scope of research:

- a comparative analysis of employment in individual EU countries in the years 2009-2018 in total and in terms of activities related to environmental protection, in order to calculate the share of employment in "green" sectors (www3, www4)
- analysis of the country's innovation level in 2012-2018 (www5)
- analysis of the efficiency of waste management in the EU countries in 2009-2018 (www2)
- analysis of the quality of life index in EU countries in 2012-2018 (the analysis was based on the currently functioning quality of life index, available for several years and for most EU countries) (www6)
- examining the relationship (correlation coefficient) between the share of jobs in the field of waste management in the employment structure and the efficiency of waste management in individual EU countries
- examining the relationship (correlation coefficient) between the share of jobs in the field of research in the employment structure and the level of innovation of individual EU countries
- examining the relationship (correlation coefficient) between the level of innovation in EU countries and the effectiveness of their waste management
- examining the relationship (correlation coefficient) between the share of green jobs (all jobs in the field of environmental protection) in the employment structure of EU countries and their quality of life index (www6)

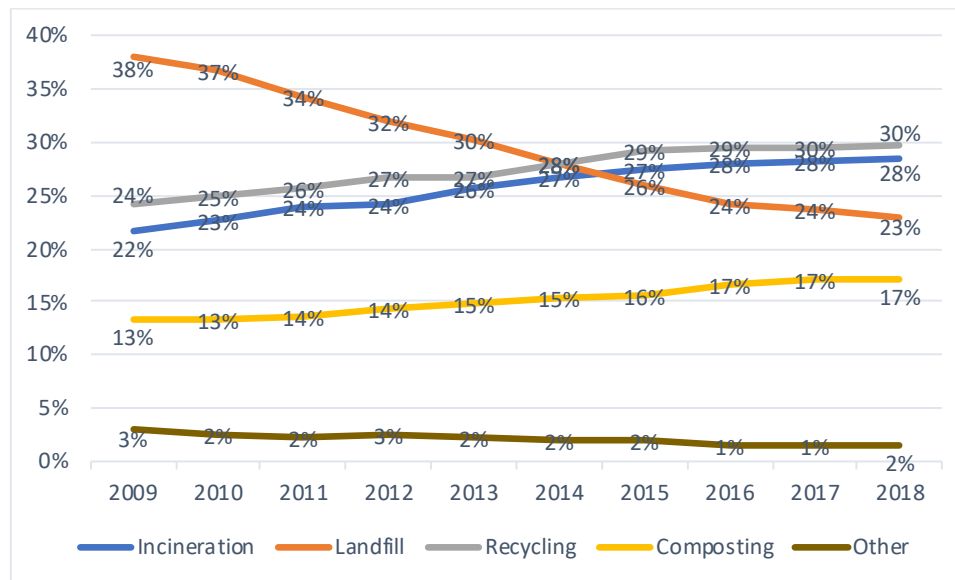
### **3. Results and Discussion**

Treating green jobs as employment in all areas related to environmental protection, i.e. according to a narrower definition, it can be noticed that in the period 2009-2018 their share in the total number of employees increased from 1.93% in 2009 to 2.18% in 2018.

At the same time, in the period 2009-2018, the structure of waste management methods changed significantly in line with the recommendations of the circular economy model. Thus, it can be said that waste management in the European Union shows the right trends, ie the level of municipal waste disposed of in landfills is decreasing, while the level of recovery, ie incineration

and recycling, is increasing. However, it should be noted that these levels are far from the targets set for the following years, as shown in Fig. 3.

**Fig. 3** Waste management in 2009-2018



Source: (www2)

The comparison of the share of employment in all areas of environmental protection in the overall employment structure in the EU countries in 2009-2018 with their efficiency in waste management, expressed as the share of landfills in all waste management methods, shows that the relationship between these variables is low. The correlation coefficient in 2018 was -0,27 and average level of this index in period 2009-2018 was -0,30.

There is a much stronger correlation when comparing the efficiency of waste management and the share of employment in the R&D area in EU countries - the correlation coefficient in 2009-2018 was on average -0,56, while in 2016, 2017 and 2018 it was -0,72. -0,75 and -0,76. This means that the greater the share of employment in the R&D sector, the more effective waste management is.

These results show that the mere increase in employment in the areas of environmental protection does not translate into the efficiency of waste management to the same extent as the activation of employment in the R&D area, which results in the creation of innovative technologies. The share of employment in the R&D area in the EU countries also significantly influences the assessment of the level of their innovativeness. The correlation coefficient in 2012-2018 was at an average level of 0,63, which means that creating employment in the R&D area in EU countries has a positive effect on the level of their innovativeness. At the same time, innovations has

a strong impact on the efficiency of waste management. In 2012-2018, the average level of the correlation index here was on average – 0,85, which means that the higher the evaluation of the level of innovation, the lower the share of landfills in waste management methods (better efficiency of waste management).

There is also a positive relationship when comparing the share of green jobs (employment in all areas of environmental protection) with the quality of life index. In 2014-2018, the correlation coefficient increased from 0,21 to 0,55, which means an increasing impact of creating green jobs on the quality of life.

The analysis of the relationship between the discussed variables in 2018 is presented in Tab. 1.

**Tab.1** Analysis of selected variables regarding the impact of green jobs in 2018

2018	Environmental Protection employment (as a % of total employment)	Scientific research and development employment (as a % of total employment)	% of landfill	Innovation index	Quality of Life Index	Correlation coefficient				
						a	b	c	d	e
Austria	4,19%	0,30%	2,21%	126,42	190,22	-0,27	-0,76	0,66	-0,83	0,55
Belgium	0,87%	0,42%	0,98%	130,91	164					
Bulgaria	1,63%	0,24%	61,15%	48,80	129,69					
Croatia	2,34%	0,28%	66,23%	61,57	162,36					
Cyprus	missing data	0,00%	69,93%	87,00	missing data					
Czechia	2,40%	0,43%	46,30%	90,86	162,01					
Denmark	2,89%	0,56%	1,12%	143,62	197,75					
Estonia	4,75%	0,19%	21,50%	105,74	176,44					
Finland	5,29%	0,83%	0,72%	146,65	195,3					
France	2,11%	0,71%	20,46%	114,70	166,22					
Germany	1,54%	0,56%	0,82%	129,53	190,04					
Greece	missing data	0,14%	78,40%	82,42	137,43					
Hungary	missing data	0,28%	49,64%	70,74	132,31					
Ireland	1,74%	0,30%	14,35%	121,25	163,53					
Italy	1,89%	0,28%	21,50%	86,15	146,13					
Latvia	3,10%	0,22%	58,85%	66,78	missing data					
Lithuania	3,11%	0,49%	24,60%	81,94	148,98					
Luxembourg	6,13%	0,65%	4,30%	132,57	missing data					
Malta	1,59%	0,00%	83,18%	90,81	missing data					
Netherlands	1,69%	0,48%	1,42%	136,23	191,25					
Poland	1,46%	0,18%	41,77%	60,22	146,58					
Portugal	2,24%	0,19%	48,30%	99,63	166,71					
Romania	1,77%	0,23%	80,61%	32,89	144,05					
Slovakia	missing data	0,28%	55,37%	70,55	155,37					
Slovenia	2,93%	0,45%	9,61%	94,43	175,36					
Spain	1,67%	0,28%	53,61%	86,23	174,92					
Sweden	1,23%	0,63%	0,68%	150,50	176,81					
United Kingdom	1,30%	0,47%	14,98%	130,20	171,89					

\*calculations excluding Cyprus, Greece, Hungary, Slovakia (missing data)

\*\*calculations excluding Cyprus, Greece, Hungary, Latvia, Luxembourg, Malta, Slovakia (missing data)

Source: (www2), (www3), (www4), (www5), (www6)

## 4. Conclusions

Along with new concepts regarding the development of the EU, taking into account environmental issues, there is an increase in environmental standards to be met by EU countries, especially in the field of implementing the circular economy model expressed in waste management methods. At the same time, it is accompanied by an increase in expectations regarding the improvement of the quality of life, which is also influenced by the condition of the natural environment. However, measuring the impact of green jobs on the indicated areas is much more difficult. On the basis of the research carried out covering the EU countries in 2009-2018, it can be concluded that the ambiguous definition of green jobs significantly hinders the implementation of research due to their availability, proper selection and then formulation of conclusions.

Using a narrower definition of green jobs, and thus limiting them to employment in industries related to environmental protection, it can be noticed that for the implementation of the assumptions of the circular economy expressed in the ways of waste management in individual countries, the share of employees in this specific area (in relation to total employment) it has a much smaller impact than the share of employment in R&D. This justifies the sense of the analysis in the broader definition of green jobs. At the same time, the share of employment in R&D in EU countries has a positive impact on the assessment of their innovativeness, while innovation has a strong positive relationship with the efficiency of waste management. Thus, this indicates a significant impact of creating green jobs on the economic dimension of EU countries. On the other hand, in the social dimension, the positive impact of creating green jobs can be illustrated by their increasingly stronger relationship with the shaping of the quality of life assessment indicators.

In conclusion, it can be stated that the creation of green jobs is important for the implementation of the socio-economic development of the EU, but a broader definition is justified, taking into account the research and development activity, resulting in the creation of innovative technologies which have a positive impact on the environment, as well as improving the quality of life. At the same time, this topic, due to the multithreaded definitions of green jobs hindering their proper measurement, as well as the high dynamics of changes in recent years in the development concepts and guidelines for environmental standards, can be a space for further research work.

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