

ECO-ECONOMIC DECOUPLING UNDER GREEN DEAL POLICY¹

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This paper summarizes the arguments and counterarguments within the scientific discussion on promoting green transformation in Ukraine under developing green deal policy. The authors noted that established by European Commission, the "European Green Deal" opens a window of opportunities and provides new threats for the Ukrainian economy. The relevance of this scientific problem is that increasing energy efficiency and increasing the share of renewable energy would enhance economic activity and social welfare in Ukraine. Thus, elaborating on green deal policy would provide economic development without additional environmental pressure. Herewith, eco-economic decoupling ensures the growth of Ukrainian business attractiveness on the EU market. The main purpose of the research is to investigate the Ukrainian potential for economic growth while decreasing CO2 emissions. This study involved the bibliometric analysis of high-quality scientific documents published after announcing the communique "European Green Deal" by the European Commission. Thus, the period of publications covered 2019-2021. The study sample consisted of 284 documents published in the scientific journals indexed by the scientometric database Scopus. The search of documents was conducted by the keyword "green deal" in the titles, abstracts, and keywords fields. Therefore, the systematization of the scientific sources indicates that the scientists investigating the green deal policy focused on different aspects regarding environmental policy, energy efficiency, renewable energy sources, and economic decarbonization, decreasing emission under developing low-carbon technologies, etc. The research empirically confirms and theoretically proves that green transformation could enhance the economic growth and expansion into new markets under EU restrictions concerning the eco-friendliness in business activity and production. Besides, the effective green deal policy would increase employability, contribute to the implementation of energy-efficient technologies, boost research and development activity, and increase business performance through the rational use of energy, resources, emission reduction, etc. The results of this research could be considered as the foundation for further research concerning investigating the components of the green deal policy.

Keywords: *bibliometric analysis, CO2, energy-efficiency, green deal policy, green transformation.*

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INTRODUCTION

In December 2019, the European Commission established the new strategy "European Green Deal" (EGD), which was accepted by many countries, especially the EU members. EGD policy mainly aims to decrease the carbon emissions to zero-level until 2050 to make Europe's economy carbon-free and prosperous. It stands to mention that the EGD ensures the green transformation under technological development of industry, implementing innovations in reducing emissions, energy efficiency growth, circular economy, changing the traditional energy sources by renewables ones, etc. Considering the unexpected COVID-19 pandemic slowed down the EGD development, the current recovery requires a more sustainable, green, and digital economic and environmental transformation. Notably, green policies and activities mainly address the following areas: environment; energy; industrial policy; sustainable and smart mobility; low-carbon economy and regional development;

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sustainable development goals; R&D on climate change; sustainable finance; international cooperation, etc.

On the other hand, in 2020, the Ukrainian government declared a determination to join EGD. It causes the necessity to close Ukrainian legislation to the EU requirements concerning the ecological and economic challenges. Besides, nowadays, the Ukrainian green policy requires determining the green transformation scenarios and targets to change the resource and energy consumption model. In turn, the Ukrainian Green Deal would provide green growth on rational and effective economic resource use, implementation of energy-efficient technologies, and green innovations [16].

GOAL SETTING

Many scientists investigating climate change emphasized its negative consequences causing health risks, reducing productivity, ecosystem degradation, resource depletion, etc. Therefore, combating climate change is a global challenge that needs international collaboration. Notably, the green transition in Ukraine is caused by global initiatives. Indeed, the current economic greening in Ukraine comes at the market transition and institutional changes. Nowadays, market competitiveness and climate change urgency require market entities to increase the added value under cost reduction, rational use of resources, responsible consumption, environmental protection, etc. Therefore, Ukrainian energy policy should be adapted to the European requirements to ensure sustainable development and competitiveness in the global market.

This paper aimed to investigate the Ukrainian potential for economic growth while decreasing CO₂ emissions.

LITERATURE REVIEW

The systematization of scientific background showed the snowballing publication activity focused on green deal policy. Therefore, this paper provides the bibliometric analysis of the scientific publications indexed by the Scopus database. The search of documents was conducted by the keyword "green deal" in the titles, abstracts, and keywords fields. The period of publications was 2019-2021. Therefore, the study sample is 284 documents, while 126 documents were published in 2021, 142 – in 2020, and 16 – in 2019.

Table 1 demonstrates that the European Commission Joint Research Centre scientists were the most active (19 documents). Notably, this affiliation funds multidisciplinary studies, while environmental science is the most popular. The analysis of documents by subject areas showed that 28.2% of documents were devoted to environmental aspects, 20.5% – social issues, 17.9% – energy, and 10.3% – engineering. In turn, in the study [25], the authors analyzed how EGD contributes to transport decarbonization under digital transformation. On the other hand, a significant interest in determining the triggers for developing the concepts related to bio-economy (bio-based, circular, green economies, etc.) [8].

Table 1 – Top-5 productive affiliations investigating the green deal issues (2019-2021)

Name	Country	Documents by research area	Total number of documents	Total authors
European Commission Joint Research Centre	Belgium	19	25574	5032
Wageningen University & Research	Netherlands	10	83255	19812
European Commission	Belgium	7	7064	2281
Riga Technical University	Latvia	7	9045	2956
Utrecht University	Netherlands	6	114666	15291

Sources: systemized by the authors based on Scopus database.

Consequently, the second place of research productivity was the scientists from the Wageningen University & Research (10 documents). The scientists mostly investigate the further transition scenarios for bio-economy development under EGD [23;9]. In turn, under

Therefore, Figure 1 presents four main research directions. The most significant cluster (red) consists of 30 items. This cluster indicates that scientists mainly studied environmental policy, while the particular interest was in investigating the impact of the coronavirus pandemic. The second cluster (green) covers the energy-efficiency aspects. The third cluster (blue) combines 20 items which indicate the research direction towards developing renewable energy sources and economic decarbonization. The fourth cluster (yellow) expresses the researches in decreasing emission under developing low-carbon technologies.

RESULTS

Ukraine is a potential energy and trade transit corridor between East and West, while the Ukrainian economy is primarily focused on exports of low-value-added primary goods. Besides, the high depreciation of fixed assets and outdated technologies provoke overconsumption of raw materials, natural resources, materials, and energy. It stands to mention that in 2019, the final energy consumption in Ukraine was 2.2 times higher than the EU average (Fig. 2). Besides, nowadays, Ukraine faces several serious problems related to the escalation of the conflict in the east of the country, the occupation of Crimea, and the economic crisis straining by the COVID-19 pandemic. Therefore, the green transformation of the economic development model is placed on the Ukrainian agenda.

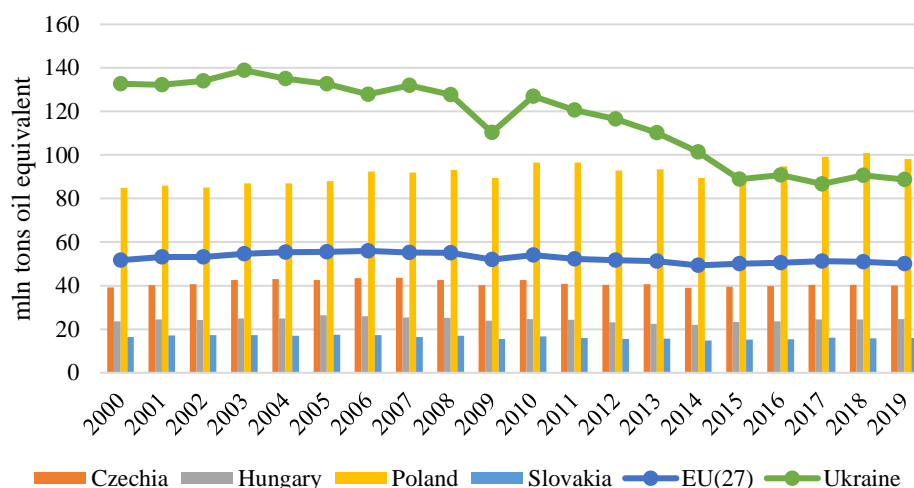


Figure 2 – Energy efficiency dynamic in Ukraine and EU countries (2000-2019)
Sources: developed by the authors based on the Eurostat data.

It is expected that green transformation would contribute the economic development and entrance to the new markets; increase employability; promote the implementation of energy-efficient technologies and innovation activity [4; 20; 18]; increase the business performance [3; 22] through effective use of energy, resources, and emission reduction, etc. The development of energy efficiency and renewable energy sources are considered to be the key direction in green energy transformation. In this case, the green deal policy would contribute to GDP growth and increase social welfare while decrease energy consumption for industrial needs. At the same time, the energy resources structure would change significantly due to economic electrification. Thus, it would result in the necessity to increase the share of renewable energy and decrease fossil fuels [5].

Notably, Ukraine has significant potential in developing renewable energy sources [19; 29; 1; 12; 31]. Figure 3 demonstrates that the total energy consumption by renewable energy sources has a growing tendency. In turn, in 2018, the amount of renewable energy consumption increased by 2.1 times compares to 2007. However, it could be suggested that Ukraine would not achieve the indicative target of 11% for renewable energy in final energy

consumption (8590 thsd toe) until 2020, set by the National Renewable Energy Action Plan 2020 [24]. Therefore, there is a need to enhance renewable power generation.

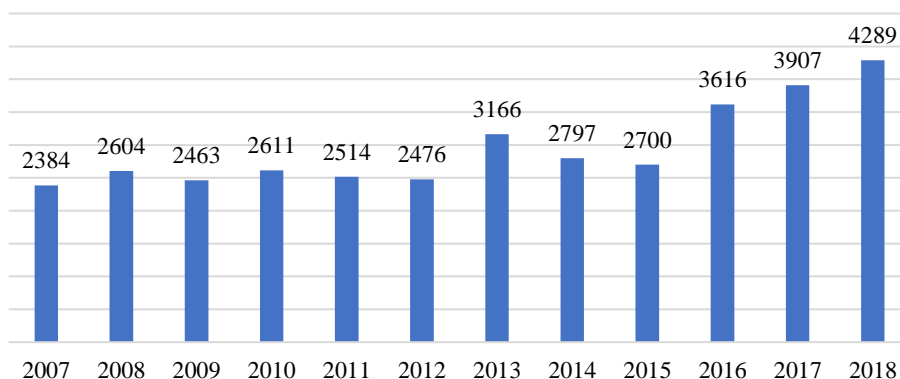


Figure 3 – Renewable energy consumption in Ukraine, thsd tons oil equivalent (2007-2018)

Sources: developed by the authors based on the Eurostat data.

Indeed, industrial development provoked the growth of CO₂ emissions that worsens climate changes and threatens humanity. Fig. 4 demonstrates the dynamics of CO₂ emissions in Ukraine comparing the EU average level. It stands to note that in 2009, the level of CO₂ emissions decreased by approximately 15% compared to 2014. It was mainly caused by reducing the economic activity because of the global financial crisis. Moreover, compared to the previous year, in 2015, the CO₂ emission decreased by 13% since the Ukrainian industrial production slowed down because of the negative geopolitical situation and losing several significant markets. Thus, there is a CO₂ gap of 2.4 times. Therefore, there is a need to decouple this relationship by intensifying the renewable energy capacity.

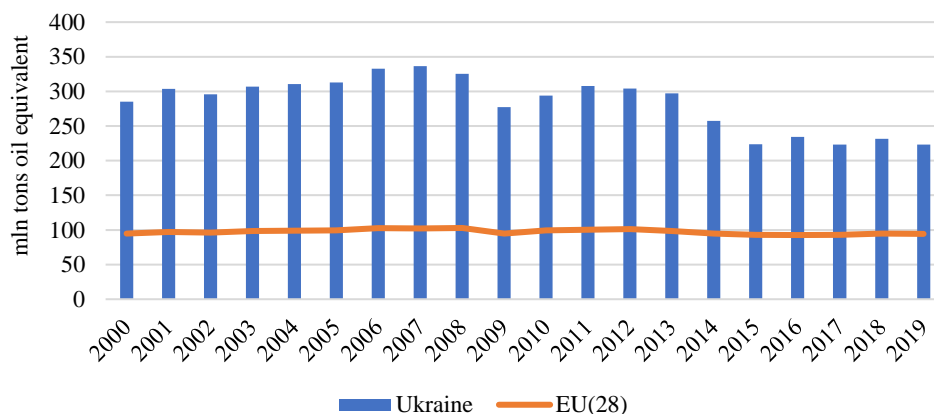


Figure 4 – Annual CO₂ emission in Ukraine and EU(27)

Sources: developed by the authors based on [15].

On the other hand, it is essential to compare the CO₂ productivity in Ukraine and the EU. Notably, CO₂ productivity determines the relation between GDP per unit of energy-related CO₂ emissions. Thus, Fig. 5 demonstrates that in 2018, the CO₂ productivity level in Ukraine increased by 2.4 times compared to 2000, while in the EU – 1.58, and in the world – 1.31. Notably, the EU CO₂ productivity is higher than in Ukraine by 2.59 times since Ukraine consumes more energy while GDP is lower.

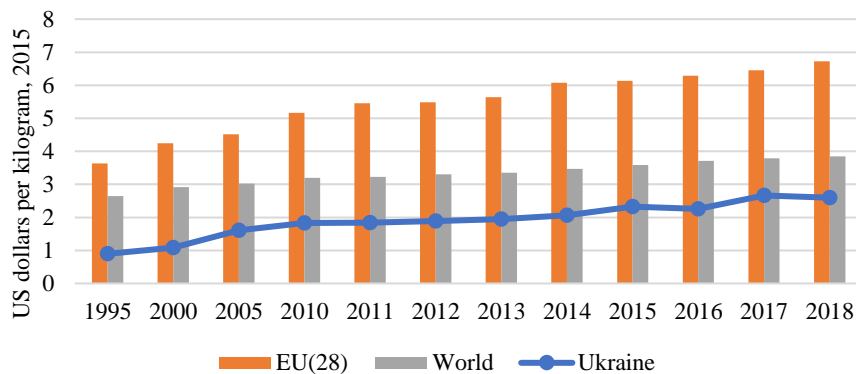


Figure 5 – Dynamics of the CO2 productivity (1995-2018)

Sources: developed by the authors based on [14].

Table 2– Main recommendation for stakeholders under implementing EGD in Ukraine

Ukrainian government	
<ul style="list-style-type: none"> – supporting the European integration under the preferred EGD fields for Ukraine; – developing the Ukrainian climate policy; – supporting the domestic producers' integration into the industrial and commercial EU chains; – enhancing the economic digitalization; – growing business awareness on the importance of low carbon footprint for exporting to the EU; – reforming Ukrainian policy under the EU requirements and considering the climate change issues, etc. 	
Business	Civil society
<ul style="list-style-type: none"> – meeting the EGD strategic goals; – attracting EGD financial resources; – improving production process to enter the EU market; – considering the EU requirements regarding eco-friendliness of products and services, etc. 	<ul style="list-style-type: none"> – increasing the green awareness in society; – ensuring all parties are informed of the opportunities and threats of EGD implementation; – controlling the process of reformation in Ukraine, etc.
EU	
<ul style="list-style-type: none"> - ensuring the assistance for Ukraine in developing the road map concerning the EGD; - supporting the investments into Ukraine to decarbonize the economy and develop green production processes; - consulting Ukraine concerning the legislation regarding environmental protection, agriculture, transport, and energy industries; - controlling the import quality and product stability, etc. 	

Sources: developed by the author based on [17; 30].

Undoubtedly, combating climate change requires political measures to maintain the low-carbon economic model, which causes economic, technological, and social changes. It is worth emphasizing that green transformation advancement requires coordinated cooperation between main stakeholders such as government, business, and civil society (Table 2). Firstly, the government must support the green growth principles while reach decisions by consensus between government, business, and society. In turn, the green policy decisions should rest on the compromises between economic development, social welfare, and environmental protection.

CONCLUSIONS

This study analyzed the role of green deal policy regarding the green transformation in Ukraine. The systematization of scientific treatises indicated the snowballing interest in investigating the green deal policy worldwide. Notably, the research directions mainly covered the issues of environmental policy, energy-efficiency aspects, renewable energy

sources and economic decarbonization, decreasing emission under developing low-carbon technologies, etc.

The findings showed that implementing the Green Deal Policy by Ukraine would contribute to economic recovery, improving the living standards of citizens, increasing business competitiveness, protect the environment, etc. Besides, in this case, energy efficiency and CO₂ reduction are priority areas in economic greening. Thus, energy-efficient growth could reduce energy consumption while providing economic growth. Therefore, it is essential to involve all stakeholders in developing green deal policy to ensure green transformation and economic enhancement.

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АНОТАЦІЯ

Пімоненко Т., Люльов О., Ус Я., Самусевич Я., Василина Т. Роль зеленої угоди у досягненні економічного декарбонізації

У роботі узагальнено аргументи та контраргументи в рамках наукової дискусії щодо промоції зелених трансформацій в Україні в рамках розробки політики зеленої угоди. Автори зазначили, що проголошений Європейською комісією "Європейський зелений курс" відкриває вікно можливостей для економічного розвитку в Україні. Актуальність цієї наукової проблеми полягає в тому, що підвищення енергоефективності та збільшення частки відновлюваної енергії сприятиме розвитку економічної діяльності та соціального добробуту. Таким чином, розробка політики зеленої угоди сприятиме економічному зростанню при одночасному зменшенні додаткового навантаження на навколишнє природне середовище. Варто зазначити, що досягнення екологічного декарбонізації підвищить конкурентні переваги українського бізнесу на ринку ЄС. Основною метою дослідження є аналіз потенціалу економічного зростання при зменшенні викидів CO₂ в сучасних реаліях України. У рамках роботи, автори здійснили бібліометричний аналіз наукових праць, опублікованих після презентації Європейською комісією комюніке "Європейська зелена угода". Таким чином, періодом публікацій є 2019-2021 роки. Вибірка дослідження складається із 284 статей, опублікованих у наукових журналах, які індексуються наукометричною базою даних Scopus. Пошук релевантних публікацій здійснено за ключовим словом "green deal" в полях заголовків, анотацій та ключових слів. За отриманими результатами встановлено, що науковці приділяють особливу увагу дослідженню питань екологічної політики, енергоефективності, відновлюваних джерел енергії та декарбонізації економіки, зменшення забруднення, розробки низьковуглецевих технологій тощо. За результатами проведеного дослідження встановлено, що зелена трансформація в Україні сприятиме економічному зростанню та експансії на нові ринки ЄС. Крім того, це підвищить можливості працевлаштування, сприятиме впровадженню енергоефективних технологій, стимулюватиме науково-дослідні та дослідницькі розробки та забезпечить зростання економічної ефективності внаслідок раціонального використання енергії, ресурсів, скорочення викидів CO₂ тощо. Отримані результати можуть бути основою для подальших досліджень особливостей політики зеленої угоди.

Ключові слова: бібліометричний аналіз, CO₂, енергоефективність, політика зеленої угоди, зелена трансформація.