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# THE GREEN COMPETITIVENESS AS AN INDICATOR OF SUSTAINABLE DEVELOPMENT

*Summary*

The green economy, the development and enhancement of green competitiveness of the company are the key determinants of sustainable economic and social development. The aim of the article is to determine the features, determinants and drivers of the green competitiveness of the company. The article pointed out the system of green competitiveness of the company and has to include the three main clusters: economic; environment and social. The study offers the concept of green competitiveness system and the evaluation approach that is based on systems analysis, which provides a new perspective way for the empirical research of green competitiveness.

The article substantiates that the system of green competitiveness of the company should include three main clusters: economic, environmental and social. The authors argue that the effectiveness of green competitiveness is determined by a number of factors: the share of green goods and services; the speed of implementation of green innovations; the ability to gain and maintain market share; initial prerequisites for development; the level of perception of green innovations; development of ecological culture in society.

The authors identify the subsystems that first need to be assessed: the production process, consumption, infrastructure, corporate culture, resource use, the extent of pollution.

*Keywords: sustainable development, green production, pollution, innovation, green competitiveness, efficiency.*

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# ЗЕЛЕНА КОНКУРЕНТОСПРОМОЖНІСТЬ ЯК ІНДИКАТОР СТАЛОГО РОЗВИТКУ

*Анотація*

Екологічна економіка, формування та підвищення зеленої конкурентоспроможності компанії є ключовими детермінантами функціонування сталого розвитку економіки та суспільства. В статті обґрунтовується, що концепція зеленого виробництва - це концепція, яка розвивається динамічно та потребує відповідного удосконалення теоретико-методологічних засад та практичного інструментарію регулювання. Метою статті є визначення особливостей та детермінант зеленої конкурентоспроможності компанії, формування концептуальних засад її оцінювання. Аналіз закордонних напрацювань дозволив зробити висновок про необхідність удосконалення теоретичних основ визначення зеленої конкурентоспроможності компаній в контексті конкретизації основних її складових та детермінант.

У статті обґрунтовано, що система зеленої конкурентоспроможності компанії повинна включати три основні кластери: економічний,екологічний та соціальний. Автори доводять, що результативність зеленої конкурентоспроможності визначається низкою чинників: часткою зелених товарів та послуг; швидкістю впровадження зелених інновацій; можливістю здобуття та збереження частки ринку; початковими передумовами розвитку; рівнем сприйняття зелених інновацій; розвитком екологічної культури в суспільстві.

При цьому зелена конкурентоспроможність повинна бути забезпечена на всіх рівнях економіки: на рівні країни, на регіональному рівні, для компаній та інших стейкхолдерів. У дослідженні обґрунтовано складові системи зеленої конкурентоспроможності та підхід до оцінювання, який формується на засадах системного аналізу, що забезпечує новий перспективний шлях для емпіричного дослідження екологічної конкурентоспроможності. Авторами визначені підсистеми, які в першу чергу потребують оцінювання: процес виробництва, споживання, інфраструктура, корпоративна культура, ресурсокористування, масштаби забруднення.

*Ключові слова:* сталий розвиток, зелене виробництво, забруднення, інновації, екологічна конкурентоспроможність, ефективність.

Кількість джерел -15, кількість таблиць -1.

**Introduction.** Today a lot of countries provide the green development strategies in a bid to address global environmental challenges and achieve regional sustainable development. Thus, the Green New Deal is put forwarded in the United States and enacted the Climate and Energy Security Act to improve national green competitiveness by investing in clean energy.

The Japanese government advocated innovation and hopes to reduce greenhouse gas emissions while striving to improve the country's green competitiveness through the low-carbon model (Cheng, 2019).

**Literature review.** Considered scientific literature proved that there are few approaches to determine green competitiveness and the key determinant of their defining.

Thus, according to (Porter, 1991) green competitiveness could be provided based on the green economy model, implementing the sustainable development goals, environmental protection and healthy lifestyle. Also, such category is connected with the green goods and services production and could be analyzed on the level of companies and countries. So, the OECD definition on the environmental goods and services includes all activities that measure, prevent, limit, minimize or correct environmental damage (OECD, 1998).

At the same time the concept of green production is the one that is developing dynamically. Due to the technology and innovations are advanced and the economy is growing, the meaning of GP and measuring continues to expand. Producing the green products have to be accompanied by upgrading their high energy consuming production equipment, implementation of innovation, new materials and technologies, management systems and approaches company's green image and culture creation. In addition to, in the process of designing green products, businesses should consider expanding the functionality of these products and identify new applications to reuse them. Thus, they can reduce the amount of raw materials consumed and the waste produced.

The World Economic Forum (2016) defined sustainable competitiveness as a set of institutions, social institutions, policies, and other elements that enable a country to maintain high productivity in a long run and ensure the sustainability of social and environmental development.

Kamierczak-Piwko, L., Ganczewski, G. (2019) focuse on aspects connected with ecological competitiveness, which is determined by the level of

environmental pressure in the areas of goods and services production, the scale of using a specific electricity generation structure. A lot of scientists (Bowen, A., Fankhauser, S. (2011), Henderson, H., Sanquiche, R., Nash, T. (2013)) are also debating about the essence of green economy, green business, green entrepreneurship in the context of defining the main features and determinants of green competitiveness.

Analysis of scientific literature (Hidalgo et al., 2007; Hausmann and Hidalgo, 2010) on the competitiveness has suggested that green competitiveness approach is more likely to be derived from existing companies' advantages, skills and production features. So, the Huberty et al., (2011) emphasizes the Germany's comparative advantage in wind turbines and that also determine their green competitive advantages.

Consequently, existing capabilities, new innovative methods and approaches, and technologies can be used as a key indicator towards future comparative advantage in the green economy.

Thereby it is necessary to develop theoretical basis to determine the green competitiveness, to specify the main components and determinants.

**The aim of the article** is to determine the features, determinants and drivers of the green companies' competitiveness.

**Results**. Alongside with the economic and technologic development countries have faced challenges realizing sustainable developmental goals. Climate change, environmental pollution, and resource crisis are global environmental problems which determine countries progress strategy. According to the Global Carbon Budget (2019) the concentration of carbon dioxide ($CO_2$) in the atmosphere has increased from approximately 277 parts per million in 1750 to 407 parts per million in 2018 (fig. 1).

According to Landrigan, (2018) environmental pollution caused 9 million premature deaths in the world in 2015, accounting for 16% of global deaths. At the same time data from the European Union (Yan, 2016) also indicated that the global economic losses caused by air pollution would reach 2.6 trillion US dollars per year, accounting for about 1% of global GDP. In this case the governments have to advocate for the green innovation that will lead to the reducing of greenhouse gas emissions while striving to improve the country's green competitiveness through the low-carbon model. Traditionally (The Global, 2019) the methodology of computation of global competitiveness consists of the following groups of categories:

- enabling environment, which including institutions, infrastructure, ICT adoption; macroeconomic stability;
- human capital: health, skills;
- markets: product, labor, financial system, market size;
- innovation ecosystem: business dynamism, innovation capability.

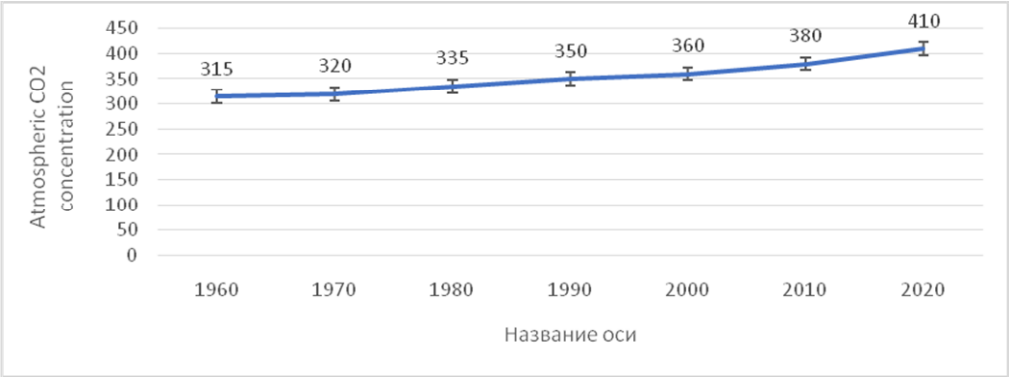


*Figure 1 Average atmospheric concentration $CO_2$*

Source: compiled by the authors based on Global Carbon Budget, (2019)

Due to this it became clear that environment competitiveness must consist from the three main components: environmental, social and economic. Conflicts between economic, social and environmental factors can be mitigated by adopting a holistic and longer-term approach to countries growth. Figure 2 shows the level of global competitiveness index for the countries. On the global level, Ukraine has the 85 place in the ranking of competitiveness among 141 countries (The Global, 2019).

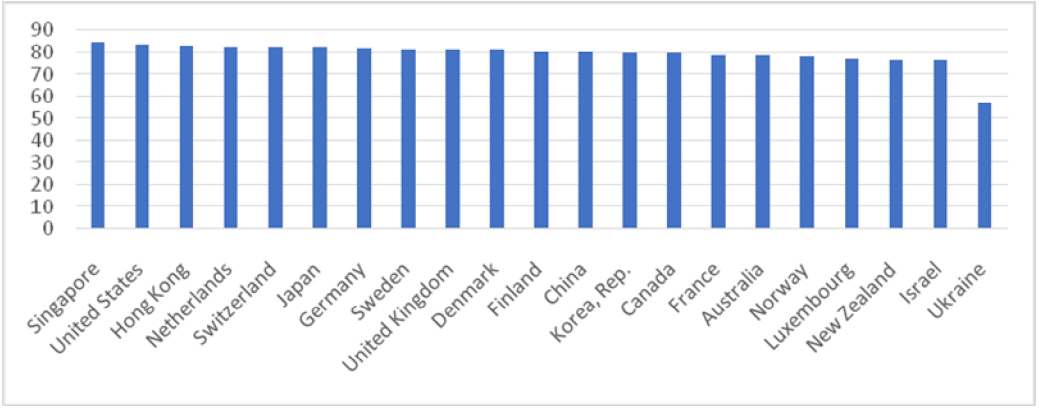


*Figure 2 Global competitiveness index for the countries*

Source: compiled by the authors based on The Global Competitiveness Report, 2019).

It has to be noted, that components connected with the green development and green innovation are emitted in the system indicators to measure global competitiveness.

Thus, it is necessary to emphasize the main features and basic determinants of green competitiveness. Green development and environmental economics have to arrange the green competitiveness on all levels of economy: on state level, on regional level and companies and stakeholders level.

Thus, the main categories and features which should be provided are the following: 1) sustainable economic performance, resource and environmental advantages, social development; 2) productivity of green production and services and energy saving; 3) creation and maintaining business environment that enables companies to produce more value and as a result increase wealth of the population; 4) efficiency and productivity on regional and economic levels; 5) clean environment, recycling, implementation of renewable, corporate environmental management, green corporate standards and culture; 6) efficiency, fairness, producing and implementation of innovation; 7) dematerialization of managerial processes, applying hardware elements and software environment, which will reflect the competitive advantages in people's living standards and infrastructure; 8) promotion of green consumption, technological innovation, implementation of technological innovations into the commercial processes.

The success of green competitiveness is determined by the list of factors namely: the share of green goods and services; the speed of green innovation implementation; the ability to gain and maintain market share; favorable starting point (initial preconditions of the development); the level of perception of green innovation; development of green culture in the society.

Generalizing the methodological and applied approaches to determining the competitiveness and it's green features allowed to create the basics for describing the components of green competitiveness.

To sum up, the evaluation of green competitiveness of the companies can be provided in two ways: by evaluation system for green development level; and by estimation of the green development performance (Zhang, 2020).

Development of green level focuses on describing the time-point state and efficiency of green production. At the same time the green development

performance evaluates the extent of the achieving goals. Conversely the green development competitiveness focuses on the capacity and competitive advantages of the green development.

The study offers the concept of green competitiveness system and the evaluation approach based on systems analysis, which provides a new perspective way for the empirical research of green competitiveness (table 1).

Table 1

**Economic component of green competitiveness evaluation***

| | | | |
|---|---|---|---|
| Economy subsystem | | | |
| 1 | Production | Production of green goods and services | Gross domestic production (GDP) per capita |
| | | Opportunity for investments | Disposable income |
| | | Development of renewable | Ratio of implemented green technologies |
| | | Ecological compatibility of production process | Pollution per unit |
| 2 | Consumption | Consumption of green goods and services | Consumption of green goods and services per capita |
| | | Energy consumption | Energy consumption per capita |
| Social subsystem | | | |
| 3 | Green corporate infrastructure | Opportunities for enhancing quality of raw material | Ratio of environment expenditure |
| | | Diffusion of information | Accessibility of information |
| | | Development of innovation | Ratio of innovativeness |
| | | Development of infrastructure | Road areas<br>Growth rate of new energy car |
| 4 | Corporate culture | Education | Staff with the environmental education |
| | | Environment management system | The level of implemented EMS standards |
| Environment subsystem | | | |
| 5 | Resource using | Development of the resource saving processes | Share of renewable |
| 6 | Pollution | Deterioration of air, water, land resources | Level of air, water, land emission<br>Environmental damage |

*Source: compiled by the authors

Thus, economic cluster plays an important role in environmental protection and social development. Well-developed economy will have the opportunity of financial support for green technologies implementation, providing renewable, ecological optimization, reducing energy consumption.

**Conclusion**. Green development competitiveness plays an active role in the construction of society on the principles of sustainable development. For solving resources- and environment-related problems arising in the process of industrialization and urbanization, necessary to extensively investigate various green development models, which will support green economics,

recycling, cleaner production, sustainable development, low-carbon economy and ecological modernization development.

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