УДК 338.45:[338.31:005.332.4](477.8) JEL R58

# S. M. Pysarenko

# Competitiveness improvement of the industrial potential of the Carpathian region

It was determined that the Carpathian region has a large multifunctional, and industrial potential, that belongs to important structural elements of its spatial equity. It was found that the policy of development of the industrial potential of the Carpathian region, increasing of its competitiveness should be part of Ukrainian, cross-border and common spatial development in terms of implementation of European integration of Ukraine. Was established that to increase the competitiveness of the industrial potential of the Carpathian region it is necessary to carry out its technological transformation system, which would include modernization of existing and construction of new production industry based on innovation, products which would correspond to competitive advantages of the region and the current requirements of both domestic and foreign markets. Organizational and-economic mechanism of technological modernization of the industrial potential the Carpathian region was developed, which is based on: the gradual approximation of Ukrainian Law to EU law, on cooperation between Ukraine and the EU on the development of the information society through providing general accessibility to information and communication technologies (ICT), increasing the participation of Ukraine research activities in the EU through ICT, involvement of Ukraine into the European research Area, which includes the Association Agreement with Ukraine and EU.

Key words: industrial capacity, competitiveness, region, economy, market, technological transformation.

Carpathian region has a large multifunctional and industrial potential, which refers to the major structural elements of spatial capital. Development policy of industrial potential and improvement of competitiveness of the Carpathian region should become a part of not only Ukrainian cross-border development, but also European spatial development under conditions of implementation of Ukraine's European integration strategy.

Formation of policy of using industrial potential of the Carpathian region and improving its competitiveness requires consideration of environmental, social, economic and cultural features.

Improving the competitiveness of the industrial potential of the Carpathian region needs the performance of its system of technological transformation that would include modernization of existing and construction of new industrial facilities on the basis of innovation, whose products would correspond to competitive advantages of the region and the current requirements of both internal and external markets.

Technological transformation of the industrial potential of the Carpathian region – it's a long-term process implementation of which is possible in two periods 2010-2015 and 2015-2020. It should make the transition from the predominance of primary exports of traditional industries to the formation of new science-intensive, export-oriented innovative products based on increasing investment – innovative image of the region; promote small business; innovation infrastructure; establishment of regional information retrieval system of innovations that requires development of appropriate organizational and economic mechanism.

Today conditions of world economy development competitiveness has become an important task and a major objective of national and regional development policy. The current low level of region competitiveness affects indirectly and adversely on dynamics

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and efficiency of both regional and national economy. The reasons for the current divergence of socio-economic development of countries and their regions, in accordance with the conclusions of the European Commission, are related to the existence of the differences in their levels of competitiveness. The competitiveness of the region is the ability of its economy to compete with economies of other country regions, as well as other countries, in terms of efficient, usage of resources, production potential, raising of productivity and supporting on this basis high economic performance and ever-increasing standard of living. The concept of competitiveness both in the domestic and international markets relates to the modern understanding of efficient using on innovative basis of region potential, including industrial. John Maynard Keynes considered that the competition is the basis for economic development in the global market and, as a result, ensures competitiveness of regions.

Due to the fact, that regions themselves become objects of international competition, the competitiveness of regions is particularly important in the modern terms of the world economy. There are many reasons to talk about formation of globalized regions, that are increasingly entering world markets on the basis of their competitive potentials, including industrial. Regions differ by their attractiveness, by the place in the regional structure of country, Europe and world.

Attractiveness is a function that depends on factors both regional and national levels. Competitiveness of industrial potential of the region also can be classified by these factors, which becomes competitive if in the region are endogenous and exogenous terms of its competitive advantage.

Proposals concerning increase the competitiveness of industrial potential of the region should be formed on the basis of preliminary analysis and assessment of competitive advantages of the region and level of its competitiveness.

Implementation of a systematic approach to the research is carried out through a combination and interaction of its key aspects as systematically-historical, which considers changes in structure of industrial potential capability, their qualitative and quantitative expression; systemic-targeted, which describes structure of industrial potential capacity, main areas of its technological modernization, aimed at objectives of socio – economic development of region and country; systematic-integrative that reveal factors of ensuring integrity of industrial potential competitiveness of region in system of national and global economy; system-management that determines characteristics of regional and national management of technological upgrading of industrial potential of region. The principle of consistency provides an opportunity to consider competitive industrial potential of region as a complex system, which is under the influence of exogenous and endogenous factors.

The exogenous factors of competitiveness of industrial potential of the region are formed on the basis of geo-economic potential, development of inter-sectoral and inter-regional integration, including regional economy, and its industrial capacity, into system of world economic relations.

The endogenous factors include quantity, quality, character, location and accessibility of development potential in region: innovation, as the share of science intensive and high-tech industries in the region; natural-resource, investment, infrastructure, human resources, industrial, agricultural, financial, environmental, organizational – technological, marketing, export.

The formation of competitiveness of the industrial potential of the region should be based on the development of effective informational-communicative links with spatial potentials, adapted to the global humanitarian economy called as attachment strategy.

Industrial potential becomes competitive if it is associated with creation, absorption and diffusion of innovations with taking into consideration changes in domestic and foreign

markets. Existing innovative approach to regional development, including formation of competitive industrial potential, is based on theory of convergence and «economic growth».

The creation of competitive industrial potential in the region needs the formation of the regional innovation system of interactive relationships between industrial firms and service industry of business environment institutions that stimulate and cause its innovativeness. Such system should be developed on basis of designed innovation strategy with a clear spatial structure.

Effectiveness of current regional innovation strategies is associated with such organizational form of spatial innovation development as clusters. M. Porter believes that clusters are «geographically proximate group of interconnected companies and associated institutions in a particular field, linked by commonalities of technologies and skills» in which communication, logistics, human resources are readily available [1].

The cluster is based on both vertical and horizontal integration using industrial potential, positive outcome of which may be associated with providing greater access to application of innovations and obtaining information, stable development of economic relationship, security of supply, availability of resource control, acceleration capital turnover and cost recovery, entering of new markets, using of skilled labor, economies of scale [2].

Important role for the formation of competitive industrial potential has regional management, which can provide using of direct and indirect methods to stimulate its innovation.

The concept of industrial potential competitiveness correlates with modern understanding of export potential of industry in region.

Export potential of industry is an amount of benefits that industry can produce and implement outside of the national economy and ability of regional industry to reproduce its competitive advantage in global market [3].

The strategic role of the export potential of the industry in the region lies in the fact that it should be a means to promote economic growth, a tool for activation of existing and potential competitive advantages.

Special feature of regions, which defines by high competitiveness of industrial potential, can be considered: high level of modern products manufacturing; innovative technological development; existence of developed partnerships relations between competing industrial enterprises; high degree of specialization of regional labor market combined with its flexibility; rapid response to solution of new problems, which arise from development of region, country and world economy [4].

Thus, formation of regional industrial potential competitiveness is complex and multilevel process of creating the conditions for its development based on assumptions, related to availability, effective use of its competitive advantages, which is caused by: the level of socioeconomic development, purchasing power, providing with financial resources, by structure of economic base; high degree of regional economic structures; spatial concentration of resources on the basis of existing potentials; high efficiency of the regional economy; ability of regional industry to adsorb business entities, capital, technology and innovation; absence of the negative impact on environment that may development industry have; degree of institutions development that provide control of industry activities; size and regional structure both regional and national sales markets; conjuncture on world market of industrial products.

**Presentation of main materials**. Carpathian region of Ukraine includes four regions: Transcarpathian, Ivano-Frankivsk, Lviv, Chernivtsi.

The basis of the formation of industrial potential of the Carpathian region primarily is the human capital and its component, employment potential. Economics of the Carpathian region employing more than 2.6 million., including basic industries (machinery, chemical industry) – 834.5 thousand people, or 33% of all employees (Table 1).

Table 1 Employment structure of labor potential of the Carpathian region (thousands of people)

Carpathian regions	Industry (machinery, chemical industry)	Agriculture	Sphere of services	Other sphere	Overall employment rate
Transcarpathian	83.8	251.2	165.0	50.0	550.0
Ivano-Frankivsk	216.8	65.2	98.3	161.7	542.0
Lviv	381.7	492.2	91.6	140.4	1105.5
Chernivtsi	152.2	96.6	56.6	50.0	355.4

Source: [5, p. 374, 321].

In the Carpathian region formed significant scientific and scientific – technical potential: 1,5 thousand doctors and candidates of sciences; more than 150 organizations that perform research and scientific – technical works, on which work 6 thousand highly qualified specialists. This is particularly important for development of such industries in the region, which have a large number of personnel involved, low metal content, increased capital intensity (radio engineering and electronic industry, instrument construction, electrical industry).

An important factor in the formation and development of industrial potential of the Carpathian region is its natural – resource potential, natural resources are different in scope and purpose.

This region has deposits of oil, gas, kaolin, magnesium and potassium salts, and coal, small deposits of iron, manganese ore, copper, silver, gold, large reserves of argillite, unique deposits of native sulfur, virtually unlimited deposits of rock salt and brimstone, kaolin, magnesium salts, alunite, zinc ore, peat, dolomite, raw materials for the building industry, stocks of different mineral waters. In Ivano-Frankivsk and Lviv regions it is expected shale gas extraction in accordance with the agreement with Chevron. Wealth of region is forest.

Taking into consideration unique nature of Carpathians mountains, its recreational value, using mineral – raw materials of Carpathians it is important to consider environmental factors.

Industrial capacity is an integral part of socio – economic potential of region. Calculation of the integral index of socio – economic potential areas of region indicate, that it is most important in Lviv (1.6803) and lowest in Chernivtsi region (1.2148).

Industry also has different meaning in the structure of areas of region economy. In accordance with calculated coefficient of specialization, industry took most significant place in Ivano-Frankivsk (1.1), and Chernivtsi (1.2) regions (Table 2).

Industrial potential in the Carpathian region is the basis of development extractive and manufacturing sectors of production. Conducted analysis of sectoral structure of industry in region led to significant conclusions about effects on dynamics of economic crisis of 2008-2009, which led to a decrease in use of existing industrial potential, which in turn have a negative impact on its competitiveness both in domestic and foreign markets.

Table 2

Coefficient of specialization of sectoral structure of economy of the Carpathian region

Carpathian regions	Industry	Agriculture	Sphere of services
Transcarpathian	0.4	1.3	1.0
Ivano-Frankivsk	1.1	0.5	0.6
Lviv	0.9	1.9	0.3
Chernivtsi	1.2	0.9	0.6

Source: [5, p. 374, 321].

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Since 2010 gradual increase in industrial production in region began, especially in processing industries (Table 3).

Some of processing industry in Carpathian region after world economic crisis 2008-2009 received growth (Table 4).

The current level of competitiveness of industrial potential of the Carpathian region is defined by low levels of its innovation update. In 2012, it was manufactured 308 units of innovation product and implemented 42 energy saving technologies (Table 5).

In current conditions there is no lack of innovation of industrial potential of the Carpathian region, which adversely affects on its competitiveness, identifying slow growth of its exports, prevalence of primary products manufactured of resources of raw materials and small proportion of innovative products. In 2013 (compared to 2012) largest export growth was in Transcarpathian region – in 4.5 times. At the same time in Ivano-Frankivsk regions

Dynamics of industrial production in Carpathian region in %

Cornethian regions	Industrial production volume		
Carpathian regions	2011-2010	2013-2012	
Transcarpathian	143.6	96.9	
Ivano-Frankivsk	100.2	95.3	
Lviv	100.9	101.2	
Chernivtsi	111.9	103.9	
Total	114.2	99.3	

Source: [5, p. 374, 321].

Table 4
Development of processing industries in Carpathian region, 2010 in % to 2009

Transcarpathian	Ivano-Frankivsk	Lviv	Chernivtsi
Pulp and paper industry			
116.5	110.7	82.4	94.6
Chemical industry			
121.9	236.4	106.2	114.7
Machine manufacturing			
220.7	121.6	110.8	127.9
Production of electricity, gas,			
water			
120.5	84.9	89.6	140.3

Source: [5, p. 374, 321].

Table 5
The development of production of innovative industrial products in Carpathian region, 2012

Carpathian regions	Production of innovative products	Implemented innovative products (%)	Introduction of new technological processes, including resource saving (units)
Transcarpathian	16	20.3	8 (1)
Ivano-Frankivsk	125	2.7	35 (19)
Lviv	117	10.1	63 (17)
Chernivtsi	50	9.4	7 (5)
Total	308	42.5	113(42)

Source: [5, p. 374, 321].

Table 3

Table 6
Characteristics of foreign economic activity of Carpathian region, 2013 (millions of dollars)

Carpathian regions	Export	Import	Balance of foreign trade turnover
Transcarpathian	1299	2062	- 763
Ivano-Frankivsk	472	578	- 106
Lviv	1290	2655	-1365
Chernivtsi	125	158	- 32

Source: [5].

experienced very little increase in exports (117%), and in Lviv and Chernivtsi regions export rised to 178.0 and 176.9% respectively.

Structure of exports of the Carpathian region is different. Four regions export oil, sulfur, chemicals, light industry, food processing, plastics, polymers, mechanical and electrical machinery, wood products.

Existent structure of exports of industry in region, the prevalence of raw goods directly with low processing is explained by, that in industries in the Carpathian region dominated third, seventh (Lviv region), fourth (Transcarpathian, Ivano-Frankivsk, Chernivtsi regions) technological structures [6].

Negative display of low competitiveness of industrial potential of Carpathian region is also in its negative balance of foreign trade turnover, and its greatest value in Lviv region (Table 6).

Main directions of improving competitiveness of industrial potential of Carpathian region. Ensuring competitiveness of industrial potential of the Carpathian region requires its technological modernization, which is in functional connection and interdependence with technological modernization of other potential spatial socio – economic system.

Technological modernization of industrial potential of the Carpathian region foresees: argumentation of priority sectors, industries and products that may be developed in short-medium term, taking into account competitive advantages of industrial potential of region on the basis of innovation; orientation of industrial investments for reconstruction and technological upgrading of existing industries; supporting development of innovation infrastructure, which provides creation of innovation clusters.

In current conditions are functioning such clusters as automobile cluster «Industrial Park» Solomon «(Transcarpathian region), exist also cluster of information technology and business – services related to the future development of IT industry (Lviv region). It is expected a creation of a cluster «Biotechnology» in direction «Improvement of chemical technologies, new materials, development of biotechnology» (Lviv region).

In the Carpathian region is exist conditions for creation of innovation clusters in food industry (meat processing and production of meat products, processing of milk and fish), forestry and wood processing industry. With consideration of geopolitical situation of region it is very perspective to develop interregional and cross-border clusters.

Creating clusters in the Carpathian region, as a whole in Ukraine, does not provide cluster strategies similar to those which exist in developed countries – members of EU on national (France, Lithuania, Latvia, Poland), regional (Luxemburg Slovenia), at national and regional (Belgium, Spain, Austria, Germany, Hungary) levels.

Technological modernization provides information services based on established information network of innovations, as an information retrieval system, aimed at development of innovation activity in the region. It should focus on research and technology, patents, economic, regulatory information, and to mediate between production of innovative product and its consumption.

For technological upgrading of industrial potential of the Carpathian region it should be done: promoting of business environment to attract foreign direct investment for innovation, their efficiency use based on innovative development priority targeting sectors and industries; scientific-practical and institutional support measures for improvement competitiveness of industrial potential of region, based on its competitive advantages, regional conditions of its use and features of world market; increased access to business investment – innovation credits with limited term of government subsidies for technological upgrading; introduction of import substitution measures in those industries that have relevant competitive advantages; introduction of constraints on maximum term of fixed assets use; promoting cross-border leasing, joint ventures; priority direction of investment, financial and credit resources to create new jobs in information-intensive industry sectors in the region; stimulation of structural changes in business.

Optimization of industrial potential of region is possible through integration of business and science, developing public-private partnerships in R & D, expansion of information, financial support, development of small innovative businesses, more efficient use of existing scientific potential based on gap interdisciplinary relations cycle «basic research – development – commercialization of knowledge in production»; supporting establishment of regional centers of introduction technologies that would be involved in assisting in acquisition of technologies (both in Ukraine and abroad), patenting; protection of intellectual property; process of auditing; providing brokerage services; creation of a national database for monitoring of the development of research and innovation process in each region of Ukraine.

Methods of direct stimulation of innovation include: extension of concessional loans for industrial enterprises and organizations which lead research and development; free transfer or granting on preferential terms of state property and land for organization of innovative industrial enterprises; development of different programs in various government departments aimed at improving business innovation activity in industry; providing of government contracts, mostly in the form of contracts for research and development; development of scientific and technological areas with special innovative investment activities [7].

Technological transformation of industrial potential of the Carpathian region is a long-term process, implementation of which can be realized in two periods: 2010-2015 and 2015-2020 (Table 7), providing transition from factor to investment model of development of industrial potential of the region based on technological modernization (2010-2015) and export-innovative development model based on restructuring of industrial potential of the region (2015-2020). It must make transition from dominance of traditional commodity export industries to formation of new high-tech export-oriented innovative products based on increasing investment-innovative image of the region; promote small business; innovation infrastructure; establishment of regional information retrieval system of innovations that requires development of appropriate organizational and economic mechanism, gradual transition from fifth to sixth technological structure.

The organizational-economic mechanism should be based on a gradual approximation of Ukraine to EU law; cooperation in development of information society by providing common access to information and communication technologies (ICT) to enhance the participation of Ukraine in EU research activities through ICT; cooperation in the mining sector; improving the business environment, especially for small and medium enterprises, implementation strategies for their development; joint implementation of programs and scientific researches, new technologies, bringing Ukraine into the European Research Area, which includes Association Agreement between Ukraine and EU.

It is necessary to take into account EU experience in improving business environment, especially for SMEs, implementing innovative strategies for their development strategies.

Table 7
Periods of increasing competitiveness of industrial potential of Carpathian region under influence of modernization and restructuring

Periods	Character of development strategy of industrial potential of region	Industries
2010-2015	Transition from factor to the investment model of development of industrial potential of region on basis of modernization	<ul> <li>increasing diffusion of high technology in middle – and low-tech sectors of industry, which will ensure in system of traditional industries, changing nature of production processes and properties of finished product, increasing its competitiveness;</li> <li>decrease in commodity exports, growth in machinery, food industry;</li> <li>development of new production technologies.</li> </ul>
2015–2020	Export-innovative model of development based on restructuring industrial potential of region	introduction of innovation;     creation of new knowledge-intensive, export – oriented products;     improve of competitiveness by improving contribution into industry of knowledge economy;     gradual transition from fifth to sixth technological structure;     improve of competitiveness on basis of innovation product export.

Source: by own elaboration

Considers questions of nature and importance of industrial potential competitiveness of region, factors of its improving. Given characteristics of industrial potential of the Carpathian region, identified necessity of its technological modernization, taking into consideration EU experience and in accordance with basic principles of EU – Ukraine Association Agreement. Great attention is paid to organizational – economic mechanism of technological modernization, necessity of priority development of innovation and innovation infrastructure.

Based on the analysis of the industrial potential competitiveness of the Carpathian region, formation of its export potential, author determined two periods of its technological modernization, taking into account necessary structural changes on the basis of innovation, conjuncture of world market and experiences of member countries of EU.

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# Писаренко С. М. Підвищення конкурентоспроможності промислового потенціалу Карпатського регіону.

Визначено, шо Карпатський регіон має великий багатофункціональний, у тому числі і промисловий потенціал, що належить до важливих структурних елементів його просторового капіталу. З'ясовано, що політика розвитку промислового потенціалу Карпатського регіону, підвищення його конкурентоспроможності має стати частиною не тільки українського, транскордонного, але й загальноєвропейського просторового розвитку в умовах реалізації євроінтеграційної стратегії України. Формування політики використання промислового потенціалу Карпатського регіону, підвищення його конкурентоспроможності передбачає врахування екологічних, соціальних, економічних і культурних його особливостей. Встановлено, що для підвищення конкурентоспроможності промислового потенціалу Карпатського регіону необхідним є проведення його системної технологічної трансформації, що передбачала б модернізацію наявних і створення нових виробництв промисловості на інноваційній основі, продукція яких відповідала б конкурентним перевагам регіону і сучасним вимогам як внутрішнього, так і зовнішнього ринків. Розроблено організаційно-економічний механізм технологічної модернізації промислового потенціалу Карпатського регіону, що має базуватися на поступовому наближенні законодавства України до права ЄС, на співробітництві України з ЄС з питань розвитку інформаційного суспільства через забезпечення загальної доступності до інформаційно-комунікаційних технологій (ІКТ), розширення участі України у дослідницькій діяльності ЄС через ІКТ, залучення України до Європейського дослідницького простору, що передбачає підписання Угоди про асоціацію України з ЄС.

Ключові слова: промисловий потенціал, конкурентоспроможність, регіон, економіка, ринок, технологічна трансформація.

### Писаренко С. М. Повышение конкурентности промышленного потенциала Карпатского региона.

Определено, что Карпатский регион характеризуется значительным многофункциональным, в том числе и промышленным потенциалом, который относится к важнейшим структурным элементам его пространственного развития. Выяснено, что политика развития промышленного потенциала Карпатского региона, повышения его конкурентоспособности должна стать частью не только украинского, трансграничного, но и общеевропейского пространственного развития в условиях реализации евроинтеграционной стратегии Украины. Формирование политики использования промышленного потенциала Карпатского региона, повышения его конкурентоспособности предполагает учет экологических, социальных, экономических и культурных его особенностей. Установлено, что для повышения конкурентоспособности промышленного потенциала Карпатского региона необходимо проведение его системной технологической трансформации, которая предусматривала бы модернизацию существующих и создание новых производств промышленности на инновационной основе, продукция которых отвечала бы конкурентным преимуществам региона и современным требованиям как внутреннего, так и внешнего рынков. Разработан организационно-экономический механизм модернизации промышленного потенциала Карпатского региона, который должен базироваться на постепенном приближении законодательства Украины к праву ЕС, на сотрудничестве Украины с ЕС по вопросам развития информационного общества путем обеспечения общей доступности информационно-коммуникационных технологий (ИКТ), расширение участия Украины в исследовательской деятельности ЕС через ИКТ, привлечение Украины в Европейское исследовательское пространство, что предусматривает подписание Соглашения об ассоциации Украины с ЕС.

Ключевые слова: промышленный потенциал, конкурентоспособность, регион, экономика, рынок, технологическая трансформация.

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Надійшло 08.10.2014 р.