

ВЫБОР ОПТИМАЛЬНОГО ПУТИ РЕШЕНИЯ ЭКОЛОГИЧЕСКИХ ПРОБЛЕМ НА ХИМИЧЕСКОМ ПРЕДПРИЯТИИ

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В промышленном производстве продукции любого вида можно выделить следующие виды загрязнения окружающей среды: а) выбросы в атмосферу; б) слив жидких отходов в природные водоемы; в) твердые отходы и шламы; г) применение несовершенных технологий производства. Естественно, что все промышленные производства работают над указанными проблемами по снижению загрязнения окружающей среды, но они, как правило, занимаются каждой проблемой в отдельности. В этой статье предлагается логистический, комплексный подход, что значительно снижает экономические затраты на решение указанных проблем в целом.

Ключевые слова: экология, маркетинг, логистика.

CHOOSING THE BEST WAY TO SOLVE ENVIRONMENTAL PROBLEMS AT A CHEMICAL PLANT

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In the industrial manufacture of products of any kind are the following types of pollution: a) emissions; b) draining liquid waste into natural water bodies; c) solid waste and sludge; d) the use of imperfect technologies. Naturally, all industrial manufacturing working on these issues to reduce pollution, but they are usually involved in each issue separately. In this article the logistics, integrated approach that significantly reduces the economic costs of resolving these problems as a whole. The environmental component of the analysis is an important prerequisite for addressing and overcoming environmental problems. Traditionally, solving environmental problems is the key to improving competitiveness in domestic and foreign markets. Overcoming environmental problems are a kind of indicator of successful operation of the industrial enterprise. With the economic crisis, environmental issues do not solve the industry. This is due to lack of funds and motivation of employees. But in crisis industrial enterprises reduced production volumes. That, in turn, leads to a reduction in emissions. Improving the environmental situation in the economic crisis is extensive by solving environmental problems.

Keywords: ecology, marketing, logistics.

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FOREIGN EXPERIENCE OF THE FORMATION THE ELEMENTS OF THE TIRE ENTERPRISES STRATEGY

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The article is devoted to the systematization of foreign experience of the tire enterprises strategy elements formation. Modern trends in the tire consumption on the world market have been considered. The directions of increasing the competitiveness of world producers by material component have been determined. The previous influence of trends of the secondary market on the production of tires has been proved based on structure of sales on the primary and secondary markets. The rating of ten largest world tire producers has been determined by means of the analysis of the structure of sales. The costs of research and development and the investment to the modernization by world tire producers have been analyzed. The prospective directions of the increasing of the environmentally friendliness of tires by material component have been formed. It was grounded that leading world producers formed the strategic approach to the solving of the ecologic problems of the tires production and exploration. The existing of foreign producers segment and domestic producers segment in Chinese and Russian tire markets was detected. It was determined that leading world producers offer to change the tires construction parameters for the providing the environmentally friendliness of tires and create the brand technologies for the strategic positioning of tires. It was proved that high part of import on the world tire market predetermines the creation of the national associations of tire producers. The purpose of these associations is to protect and support the interests of the domestic producers in the international competition. The character of the activity of these associations in Europe, India, China and Russia has been analyzed. It was proved that the absence of such associations in Ukraine decreases their protection against competition from foreign tire producers.

Keywords: enterprise strategy, tire production, product competitiveness, technology of production, geographic vector of growth.

Introduction and problem definition

Portfolio strategy is based on the determination of market geography, need, technology and recourses as the elements of geographic vector of growth according to strategic management zones (SMZ) of enterprise. The components of the estimation of the competitiveness of the enterprise production individually for every SMZ are the methodical ground in the formation of the prospective level of the coordinates of the geographic vector of growth in the portfolio strategy of tire enterprises. These components are provided considering the experience of leading world producers of tires. That is why the problem of studying the foreign experience during formation the elements of tire enterprises strategy is especially important in the conditions of increasing of the competition between national and foreign producers both internal and external tire markets.

Analysis and research publications

The prospects of the development of world tire production have been examined by such foreign scientists as K. Bakfish and D. Heints [1], Yu. P. Bass and Yu. A. Gamlitskiy [2], technological and material aspects of the tire production development have been disclosed in papers [4,6], modern trends in the demand and competition on the world tire market have been determined in papers [5,7,13,14]. The issues of the content of strategic set components at the increasing of the tire enterprise production competitiveness have been disclosed in the paper [21].

Despite the studies of the world trends of the tire production development, the issues of the using of the experience of leading tire producers as a scientific and practical base in the formation of the elements of the tire enterprises strategy remain unsolved.

The purpose of the article is to elaborate the scientific and practical recommendations for the formation of the elements of tire enterprises strategy

based on experience of leading world tire producers.

Presenting the main material

Today's tire production has such trend as: increasing of the motorization of population, changing in the consumers' requirements to the environmental friendliness and economy of tires, aggravation of ecologic problems of the tires production and exploration and forming the normative and legal base for their solving in the countries with high volumes of tires' consumption. Leading world producers have own highly developed scientific base which helps them to investigate eco-friendly materials for the production of tires and to provide their exploration characteristics on the qualitatively new level, build new factories in the countries with high demand for tires and modernize the existing enterprises for the increasing their competitiveness in a globalized car market (fig. 1)

By [15], 28% tires for passenger cars and 21% tires for tracks are sell on the primary tire market. The world demand for tires on this market is determined by volume, structure and rate of autopark growth. On the secondary tire market this indexes are complemented by rate of tires renewal and level of the motorization of population, which is determined by level of household incomes. High part of sales on the secondary market predetermines the dominant influence of its trends on the production of tires. That is why the tire producers need for depth study of demand and providing the competitiveness of the tires in the conditions of consumption.

Annual volume of sales by ten largest tire producers in 2014 was above 90 bln. EUR (table 1). Three companies – Bridgestone Corporation (Japan), Compagnie Generale des Etablissements Michelin (France), Goodyear Tire & Rubber Company (USA) – are the leaders in the tire industry. Their cumulative sales were above 60% of volume of sales by ten largest world tire producers. The first three companies were the leaders in the tire industry in the last decade but

Rating of 10 largest world tire producers in 2014

Title of tire producer	Volume of sales, mln. EUR	Rating for volume of sales	Part in total volume of sales	
			absolute, %	cumulative, %
Bridgestone Corporation (Japan)	21300,6	1	23,44	23,44
Compagnie Generale des Etablissements Michelin (France)	19161,9	2	21,09	44,52
Goodyear Tire & Rubber Company (USA)	14939,5	3	16,44	60,96
Continental A.G. (Germany)	9784,4	4	10,77	71,73
Pirelli & C. S.p.A. (Italy)	6007,5	5	6,61	78,34
Hankook Tire (South Korea)	5041,9	6	5,55	83,89
Sumitomo Rubber Industries, Ltd. (Japan)	5035,2	7	5,54	89,43
Yokohama Rubber Co., Ltd. (Japan)	3426,3	8	3,77	93,20
Maxxis International (Taiwan)	3358,7	9	3,70	96,90
Cooper Tire & Rubber Company (USA)	2821,0	10	3,10	100,00
Total	90877,0		100,00	

Note: formed and calculated by [14]

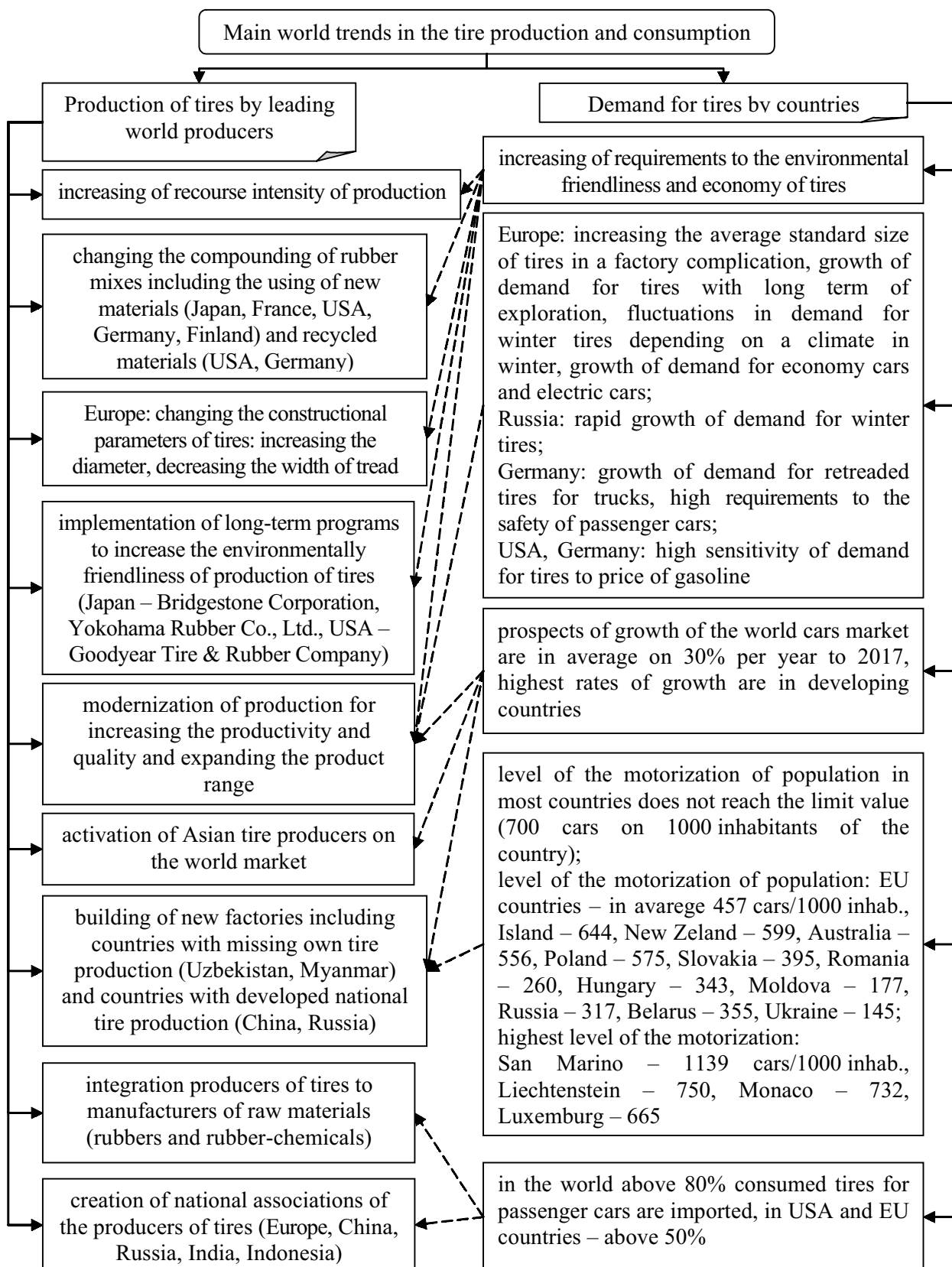


Fig. 1. World trends in the production and consumption of tires. Formed by [1,4,7,15,23,24–25] and by data of the journal «Khimia Ukrainy I Mira»

composition of the first five companies was constant [14] covering almost 80% of sales of ten largest world tire companies. Activation of Asian tire producers Hankook Tire (South Korea) and Maxxis International (Taiwan) last 10 years contributed to the their achievement of leading positions on the world market and placement among ten largest tire producers. Among Russian tire producers JSC «Cordiant» improved its position in the rating of world tire producers from 52 to 34 and JSC «Nizhnekamskshina» decreased the position from 33 to 45 in 2013 compared 2012 [5].

The results of a poll of 1400 German drivers by order from Dunlop show that 90% of the respondents give preference to the aspects of safety, less than 70% has the comfortableness and price as decisive criterions, less than 40% – point out an appearance [1].

In 2013 average level of R&D costs among 20 investigated companies was 2,4% of sales, in 2012 – 1,7% (fig. 2). Highest level of these costs was in Compagnie Generale des Etablissements Michelin (France) and Pirelli & C. S.p.A. (Italy). These companies are the members of 5 largest world tire producers. Asian tire producers have the level of R&D costs higher than average among investigated companies.

In 2013 leading world tire producers spent above 8,6 bln. USD on R&D, creation new and expansion

existing capacities. These costs are higher on 7,5% compared 2012 [7]. 77% of costs were directed to building of new factories and 23% – to modernization and expansion of the existing capacities. Average level of investments to the modernization of capacities among 20 investigated companies was 8,0% of sales in 2013 and 7,7% – in 2012 (fig. 3). The leaders by volumes of investments were Asian producers Nexen Tire (South Korea), P.T. Gajah Tunggal Tbk. (Indonesia), Maxxis International (Taiwan). They spent for modernization 10,5–17,9% of sales.

Ukrainian tire producer PJSC «Rosava» had the rate of costs for modernization 8,2% of sales. It is higher than the same average among 20 investigated world tire producers.

The prospective directions of the increasing of the environmental friendliness of tires are: the changing of the traditional kinds of materials (natural rubber and petroleum products) to new, eco-friendly, materials [6] and using the recycled materials (rubber powder) in the production of new tires [4]. This is an experience of companies Bridgestone Corporation (Japan), Compagnie Generale des Etablissements Michelin (France), Goodyear Tire & Rubber Company (USA), Continental A.G. (Germany), Sumitomo Rubber Industries, Ltd. (Japan), Yokohama Rubber Co., Ltd. (Japan), Cooper Tire & Rubber Company (USA), Nokian Tyres (Finland).

Leading world producers of tires and materials

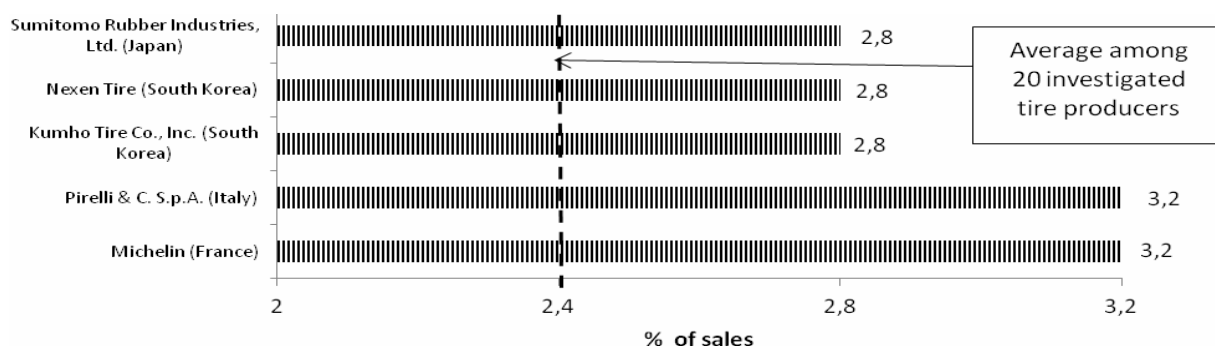


Fig. 2. Costs of research and development by tire producers in 2013. Constructed by [7]

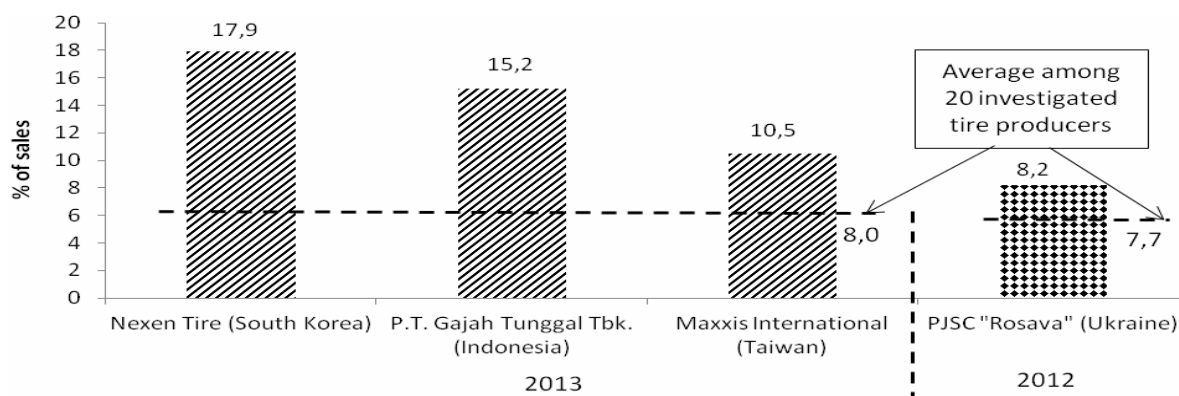


Fig. 3. Investments to the modernization of tire production in 2012–2013. Constructed and calculated by [7,20]

for tire production formed the strategic approach to the solving of ecologic problems of tires production and exploration. They have long-term objectives, plans and programs for providing the environmentally friendliness production and consumption of tires. In particular, Bridgestone Corporation (Japan) plans to 2050 the complete switch to the using of eco-friendly and full renewal materials [24] and Lehigh Technologies (USA) – to provide the production of 1 bln. tires by alternative materials [4]. The corporative initiative of Goodyear Tire & Rubber Company (USA) in cutting of volumes of the production wastes is the program Zero Waste to Landfill. According to this program all factories must to decrease, recycle and use the production wastes [17]. One of the objectives of plan Grand Design 100 by Yokohama Rubber Co., Ltd. (Japan) is creation of products and technologies for assistance to decreasing a negative influence on the environment [25].

In Russia there are two segments of tire producers as a result of creation of own local productions by foreign producers. The first, segment of foreign producers (Nokian Tyres, Compagnie Generale des Etablissements Michelin, Continental A.G., Yokohama Rubber Co., Ltd. та Pirelli & C. S.p.A.), has international standards of production. The second, segment of Russian producers, has a decreased demand, produces previously the products with a defensive value and needs of the government support [15]. In China the tire market has the similar structure, 31 domestic producers and 12 units of world tire companies [13].

In result of increasing the requirements to such ecologic characteristics of tires as levels of noise and rolling resistance, leading world tire producers Bridgestone Corporation (Japan) та Compagnie Generale des Etablissements Michelin (France) offer the changes in the tires' construction for increasing the diameter and decreasing the width of thread and Continental A.G. (Germany) already produces the tires with changed standard sizes for electric cars [23].

Leading world producers create the brand technologies for the strategic positioning of tires among analogous products by standard size. This positioning depends on competitive advantages in the production and consumption of tires [8,18,25].

High part of import on the world tire market including the markets of developed countries (USA, EU countries) predetermines the creation of the national associations of tire producers. The purpose of these associations is to protect and support the interests of the domestic producers in the international competition. European Tire & Rubber Manufacturers' Association (ETRMA) represents the interests, coordinates, communicates, supports and carries out the cooperation between its members on

the national and international levels. Its members are: Apollo Vredestein, Brisa, Cooper Tire, Marangoni, Nokian Tyres, Bridgestone, Goodyear, Dunlop, Michelin, Pirelli, Continental, Hankook, Mitas и Trelleborg [10]. ETRMA promotes principle according to which the used tires are the most valuable raw materials with increasing potential [3, p. 130].

Automotive Tyre Manufacturers' Association (ATMA) represents the interests of 11 largest Indian tire manufacturers. They has above 90% of the production of tires in the country. The main activity of ATMA is cooperation with government in assistance to development and protection of interests of tire industry [9].

China Rubber Industry Association (CRIA) acts by service principle and is created for the assistance to the development of industry, strengthening the self-discipline in industry, elaboration of suggestions in the industry legislation, support the scientific and technical innovations, solving the problems of used tires recycling, economy of energy and cutting the harmful emissions, creation the favorable terms of a trade, assistance to development of economic and technical contacts for Chinese producers on the internal and external markets [11].

The Association of Tire Producers was created in Russia. The objective of this association is to uphold and protect the interests of its members previously in government agencies. Its priority task is to elaborate the legislation of a technical safety of transport concerning tires and the project of legislation of the utilization of tires by European example [16]. The Association of assistance to recovery and recycling of tires «Shinecologia» deals with systematic solving of problems of used tires utilization [12].

In Ukraine there are not the national associations of producers of tires. This absence decreases the protection of national companies against competition from foreign tire producers.

So, the consideration of the experience of leading world tire producers will promote the formation of the elements of domestic tire enterprises strategy for increasing the level of product competitiveness both internal and external markets.

Conclusions

The scientific and practical recommendations for grounding the prospective level of the coordinates of the geographic vector of growth in the portfolio strategy of tire enterprises based on the experience of world tire producers were formed.

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ЗАРУБІЖНИЙ ДОСВІД ФОРМУВАННЯ ЕЛЕМЕНТІВ СТРАТЕГІЇ ПІДПРИЄМСТВ ШИННОГО ВИРОБНИЦТВА

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Статтю присвячено систематизації зарубіжного досвіду для формування елементів стратегії підприємств шинного виробництва. Враховано сучасні тенденції у споживанні шинної продукції на світовому ринку. Визначено напрями підвищення конкурентоспроможності світовими виробниками за виробничою складовою. На основі структури продаж на первинному і вторинному ринках шин доведено переважний вплив тенденцій вторинного ринку на виробництво шин. За допомогою аналізу структури продаж шин визначено рейтинг десяти найбільших світових виробників. Проаналізовано витрати світових виробників шин на дослідження та розробки, а також інвестиції в модернізацію виробництва. Сформовано перспективні напрями підвищення екологічності шинної продукції за матеріалознавчою складовою. Обґрунтовано, що провідні світові виробники шин та матеріалів для шинного виробництва сформуvalи стратегічний підхід до вирішення екологічних проблем виробництва та експлуатації шин. Виявлено існування сегменту зарубіжних виробників і сегменту вітчизняних виробників на ринках шин Китаю та Росії. Визначено, що для забезпечення екологічності продукції провідні світові виробники пропонують зміни конструкційних параметрів шин, а для стратегічного позиціонування шинної продукції створюють брендові технології. Доведено, що висока частка імпорту на світовому ринку шин зумовлює створення національних асоціацій виробників шинної продукції з метою захисту та підтримки інтересів національних виробників в умовах міжнародної конкуренції. Проаналізовано характер діяльності таких асоціацій в Європі, Індії, Китаї та Росії. Доведено, що відсутність асоціацій підприємств у шинному виробництві України знижує їх захищеність від конкуренції з боку іноземних виробників шин.

Ключові слова: стратегія підприємства, шинне виробництво, конкурентоспроможність продукції, технологія виробництва, географічний вектор зростання.

**ЗАРУБЕЖНЫЙ ОПЫТ ФОРМИРОВАНИЯ
ЭЛЕМЕНТОВ СТРАТЕГИИ ПРЕДПРИЯТИЙ
ШИННОГО ПРОИЗВОДСТВА**

Чернышева Е.М.

Статья посвящена систематизации зарубежного опыта для формирования элементов стратегии предприятий шинного производства. Учеными современными тенденциями в потреблении шинной продукции на мировом рынке. Определены направления повышения конкурентоспособности мировыми производителями по производственной составляющей. На основе структуры продаж на первичном и вторичном рынках шин доказано преимущественное влияние тенденций вторичного рынка на производство шин. При помощи анализа структуры продаж шин определен рейтинг десяти крупнейших мировых производителей. Проанализированы затраты мировых производителей на исследования и разработки, а также инвестиции в модернизацию производства. Сформированы перспективные направления повышения экологичности шинной продукции по материаловедческой составляющей. Обосновано, что ведущие мировые производители шин и материалов для шинного производства сформировали стратегический подход к решению экологических проблем производства и эксплуатации шин. Выявлено существование сегмента зарубежных производителей и сегмента отечественных производителей на рынках Китая и России. Определено, что для обеспечения экологичности продукции ведущие мировые производители предлагают изменения в конструктивных параметрах шин, а для стратегического позиционирования шинной продукции создают брендовые технологии. Доказано, что высокая доля импорта на мировом рынке шин обуславливает создание национальных ассоциаций производителей шинной продукции с целью защиты и поддержки интересов национальных производителей в условиях международной конкуренции. Проанализировано характер деятельности таких ассоциаций в Европе, Индии, Китае и России. Доказано, что отсутствие ассоциаций предприятий в шинном производстве Украины снижает их защищенность от конкуренции со стороны иностранных производителей шин.

Ключевые слова: стратегия предприятия, шинное производство, конкурентоспособность продукции, технология производства, географический вектор роста.