**Liudmyla Deineko**, Doctor of Economics, Professor, Head of the Department of Industrial Policy of the Institute for Economics and Forecasting of the National Academy of Sciences of Ukraine (Kyiv, Ukraine)

**Ella Sheludko**, Ph.D., Senior Researcher, Institute for Economics and Forecasting of the National Academy of Sciences of Ukraine (Kyiv, Ukraine)

**Oksana Kushnirenko**, Ph.D., Assistant Professor, Institute for Economics and Forecasting of the National Academy of Sciences of Ukraine (Kyiv, Ukraine)

# SUSTAINABLE INDUSTRIAL DEVELOPMENT IN ACHIEVING THE SUSTAINABLE DEVELOPMENT GOALS-2030 (SDGS-2030)

**Introduction.** One of the key objectives in the context of Sustainable Development Goals set out in the UN Program «Transformation of our World: An Agenda for Sustainable Development 2030» is the creation of a flexible infrastructure, promoting comprehensive and sustainable industrialization and encouraging innovation<sup>1</sup>.

As indicated L. Musina in the epigraph to Goal 9 of the National Report «The Goals of Sustainable Development: Ukraine», «the industrialization of Ukraine and the introduction of innovative technologies into production have become a precondition for sustainable growth of the national economy and optimization of its structure»<sup>2</sup>.

This quoted passage sums up the gist of important reproductive processes in industrial production and prompts to comprehend a number of topical issues concerning the restoration of the significance of the industrial potential of the Ukrainian economy.

**Current situation.** The study of the problems of sustainable development of industry, as the basis for the revival and growth of the domestic economy in the face of new national and global challenges, should aim at solving the strategic tasks of the world community and Ukraine, which are formulated, in particular, in the following documents: The United Nations Millennium Declaration (approved by the 189-nation nations in the UN Millennium Summit in 2000) – on the impact of economic trends on human development, the level and quality of life of the population, and the harmonization of external assistance for developing countries; Sustainable Development Goals (proclaimed at the 70th Session of the UN General Assembly) – on the disclosure of the possibilities for introducing rational consumption and production

<sup>&</sup>lt;sup>1</sup> Sustainable Development Goals (SDGs) (2017), UNDP. Retrieved from: http://www.un.org.ua/en/millennium-development-goals [accessed: 20 December 2017].

<sup>&</sup>lt;sup>2</sup> Національна доповідь «Цілі Сталого Розвитку: Україна» (2017), Міністерство економічного розвитку

і торгівлі України. Retrieved from https://menr.gov.ua/files/docs/ukr.pdf [accessed: December 2017].

models, natural resources management and the implementation of urgent measures in order to meet the needs of the present and future generations of people; Ukraine-2020 Sustainable Development Strategy – Reform in the field of deregulation and entrepreneurship development; reforming the protection of economic competition; participation programs in trans-European networks; the reform of the state customs business and integration into the customs union of the European Union; implementation of the program of development of Ukrainian exports, investment attraction program; regional policy reforms, etc. These tasks should also be based on the provisions of the Association Agreement between Ukraine and the EU and an in-depth comprehensive FTA with the EU, in particular, in accordance with Section IV, Trade and Trade-related Issues. The ability of the Ukrainian industry to modernize in its current state and the study of mechanisms that can contribute to its modernization and transformation is discussed in the proposed article.

Scientific novelty. The scientific vision of the domestic industry as a key element of the economic system that is able to modernize and create a foundation for industrial growth is based on a new approach to ensure its diversification and complex proportional development of the ability to save and restore traditional industrial enterprises able to provide quality improvements and stimulate the development of production systems in accordance with international requirements and with the prospect of forming the new high-tech and competitive industry sectors. Change in the paradigm of economic development is caused by transformation processes in Ukraine that began in 2013-2014, and the need to shift from subsidized state industries to manufacture competitive products in the global market. Domestic industry is now undergoing indigenous transformation against the backdrop of the extremely dynamic situation in the global industrial sector, where there is a rapid introduction of revolutionary innovations in the organization of production based on modern information technologies and industrial processes and in technology and commodity structure of industry using new products, completely new materials and production.

For the recovery of the Ukrainian economy one needs, above all, a strong, updated and modernized industrial base and therefore it is urgent to create a powerful industrial sectors with a high degree of competitive enterprises (companies) that can operate in different economic sectors: manufacturing, distribution, consumption. The task of increasing the industrial potential of Ukraine and the expansion of production capacity of markets requires an assessment of readiness of industrial complex to neo-industrial changes in the detailed breakdown (by industry) and evaluate its performance. In the context of globalization there is a need to provide growth of competitiveness of production sectors and certain types of

economic activity, which is now and may become in the future competitive in world markets, the effective demonstration of technological platforms, the availability of high technology innovation companies and industries, the ability to overcome the threat of de-industrialization countries.

In industrial policy, oriented on the neo-industrial transformation, there is a preference towards soft, horizontal adjustment methods where high priority is given to the development of public-private partnerships in order to obtain a synergy effect in the modernization of innovative renewal and diversification of domestic production structures. The key issues of industrial policy will not be the development of certain areas or prioritization of certain technologies [E. Reinert, p. 15]. The key issue in the implementation of industrial policy in neo-industrial transformations is what methods and mechanisms can be employed to implement them.

An important feature of industrialization is also that transformation emphasis is not only on strengthening the internal market or production, but also on how to develop closer links with international markets and use the opportunities opened by trade, foreign investment and involvement in global value chains.

Neo-industrial transformation can be defined as a model of industrialization, whose main task is the reconstruction of the industrial base and the introduction of fundamental innovations. The ultimate goal of neo-industrial transformation is not just industrial growth, it is focused on sustainable growth, which implies in particular the growth of employment and income, quality of life, compliance with environmental requirements, environmental protection and resource efficiency.

The current state of the industry can be described as a crisis, manifested in the rapid fall of industrial production, de-industrialization, archaism of industrial structure, reducing its competitiveness.

In recent years there is a deepening crisis in the industry, which is manifested in the rapid fall of industrial production. In particular, the decline is from 2012 and amounted to -0.5% in 2012 (compared to the previous period), -4.3% – in 2013, -10.7% – in 2014 and -13,0% – in 2015 (Table. 1)<sup>3</sup>. Even more rapid is the decline of production in the processing industry, which has a key role in the modernization of the whole economy – by 2% in 2012, by 7.1% – in 2013, by 10.1% – in 2014, by 12.6% in 2015.

<sup>&</sup>lt;sup>3</sup> Шовкун, I. (2015), «Асоціація з ЄС диктує необхідність відродити промисловість», *ZN.UA*, Vol. 38. Retrieved from: http://gazeta.dt.ua/promyshliennost/ asociaciya-z-yes-diktuyeneobhidnist-vidroditi-promislovist [accessed: December 2017].

The processes of de-industrialization of the national economy are continuing. The decline of the industry reduces employment in the sector. The industry now contains 15.6% of the employed population (compared to 16% in 2014). According to the European Commission, one manufacturing job in the EU creates 0.5 to 2 jobs in other sectors [ $\Gamma$ .Антоненко 2015, c. 5], particularly industry also provides jobs in related sectors, especially transport and trade. Thus, long turmoils in the industry are the significant factor in the crisis of all the national economy.

2011 p.	2014 p.	2015 p.
108,0	89,9	87,0
109,7	90,7	87,4
22,9	19,4	20,1
12,8	11,4	12,1
3352,7	2898,2	2573,9
61,5	44,0	29,3
141,6	74,3	80,1
	108,0 109,7 22,9 12,8 3352,7 61,5	108,0         89,9           109,7         90,7           22,9         19,4           12,8         11,4           3352,7         2898,2           61,5         44,0

**Table 1.** Selected indicators of industry in Ukraine in 2011-2015<sup>4</sup>

Note: GDP is gross domestic product.

Layoffs in industries during 2011-2015 accordingly reflected the decrease of gross domestic product. The share of industry in GDP has been reduced (from 22.9% in 2011 to 20.1% in 2015). The same occurs in the processing industry's share in GDP which fell from 12.8% in 2011 to 12.1% in 2015. Analysis of the industry by main economic activities shows that mining and processing industries together form about 80% of industrial production and supply of electricity, gas and water is 20.1% (2015) (Fig. 1). In the structure of industrial production the share of the mining industry (gradually increasing), and the share of processing industry is reduced (minimum extreme – in 2013 (61.8%).

<sup>&</sup>lt;sup>4</sup> State Statistics Service Ukraine. Retrieved from: http://www.ukrstat.gov.ua/ [accessed: 01 December 2017].



Figure 1. Structure of sales of industrial activity for the year 2008-2015

The contribution of the sector of processing industry in gross value added structure that formed the industry, also reduced (Fig. 2).



Figure 2. Structure of gross value added of industrial activity for the 2008-2015 year<sup>4</sup>

Given data is for:

 for 2008-2009, considering temporarily occupied territory of the Autonomous Republic of Crimea and in Sevastopol;

 for 2010-2015, excluding the temporarily occupied territory of the Autonomous Republic of Crimea and in Sevastopol;

- for 2014-2015 - also excluding the zone of the antiterrorist operation.

These changes occurred primarily by reducing the share of industry specializations in the creation of value added, including metallurgy, chemical, light industry and so on. Narrowing the role of manufacturing industry in creating GDP decline is a sign of economic and technological backwardness of the economy.

The report of UNIDO "Industrial Development Report 2016 (The Role of Technology and Innovation in Inclusive and Sustainable Industrial Development)" experts say that according to the annual ranking of UNIDO for the Index of Industrial Competitiveness (CIP) in 2013 Ukraine occupied 55th place among 144 countries<sup>5</sup>. Compared to 2008 Ukraine lost two positions in the ranking downward, and this happened, in particular, due to decrease in exports of manufacturing industry products per capita, reduction in the share of processing industry exports in merchandise exports and the share of medium and high-tech products in exports processing industry. In the Global Competitiveness Rating 2016-2017, presented at the World Economic Forum: The Global Competitiveness Report 2016-2017, covering 137 countries, Ukraine ranked 85th with Index 4.0 (83-91 Rankings). Already in the 2017-2018 Rating, Ukraine has shifted to its 81st position with an increase of the global competitiveness index to 4.1<sup>5</sup>.

The most dangerous for Ukraine is not the low competitiveness of products, companies, industries and the national economy as a whole, but the possibility of a systematic lag behind leading countries because of the incompatibility of technologies, low capacity of the economy to investment and innovation. The collapse of exports of manufactured goods negatively affects the financial and monetary stability of the whole economy, but it is the basis of the import of equipment and technologies that are intended for modernization of industry innovation.

This situation forms the uncontested need for reform of «traditional» industries in Ukraine and ensures the development of high-tech industries. Global experience shows that the volume of sales and exports of industrial and consumer goods stimulates economic prosperity, demanding more attention to the development of modern production facilities, investing in the development of high-tech infrastructure and education. Countries and companies seek to move to a new technological level and improve the economic well-being. Amid a combination of digital and material aspects of the production, use of innovative technologies becomes more important to improve competitiveness at both companies and states in general. High-tech industries actually form the global manufacturing landscape in

<sup>&</sup>lt;sup>5</sup> UNIDO Industrial Development Report (2016), The Role of Technology and Innovation in Inclusive and Sustainable Industrial Development, P. 204-207. Retrieved from: https://www.unido.org/sites/default/files/2015-12/EBOOK\_IDR2016\_FULLREPORT\_0.pdf [accessed: 01 December 2017].

most advanced economies and, as it turns out, may offer a clear path to achieving or maintaining industrial competitiveness.

The idea of neo-industrialization of Ukraine is to create large export sector in export terms of industrial policy, which will produce a reliable of foreign currency into the country; ensure the participation of foreign direct investment in the formation of various industries (both traditional and new), aircraft and shipbuilding, instrumentation, agricultural machinery, IT-technology, pharmaceuticals, modern energy efficient building materials, a strong agricultural sector, modern military-industrial complex. Strategy of neo-industrial transformation of industrial complex should be based on the postulate that it is the processing industry that should be the main source of economic growth, providing significant annual growth in gross value added.

Improvement of industrial development in the context neo-industrial transformation requires more detailed consideration of characteristics that affect the current development of industrial production in Ukraine and determine the readiness of the leading sectors to neo--industrial change. Traditionally, economic studies concentrate on strategic sectors (engineering, steel, etc.). Let's examine the features of such promising sectors of processing industry in Ukraine with significant potential, particularly wood and chemical industries.

**Wood industry** is one of the few sectors of the real economy, which shows gradual growth, despite the difficult conditions of operation, and its development has a significant impact on economic growth, as evidenced by the fact that because in the country there are more than 3,1 thousand enterprises with about 36 thousand workers, producing over 300 items of commodity products, which is supplied to the domestic and foreign markets. In 2016, the volume of sales of products by enterprises of the industry amounted to 22.3 billion UAH, of which, beyond the country -13.0 billion UAH.

Threatening environmental factors such as loss of traditional markets; cease of cooperative ties and economic sanctions by Russia; destruction of productive capacity in eastern Ukraine due to military operations didn't have a strong destructive effect on wood industry which shows a gradual increase in sales of 7.4 billion USD in 2010 to 18.5 billion USD in 2015.

By 2015 domestic manufacturers produced sawn or split wood, with thickness of  $6 \text{ mm} - 1.9 \text{ million m}^3$ , of softwood in Mouldings – 14.1 thousand tons, of hardwood in Mouldings – 69.1 thousand tons; Plywood – 186 ths. m<sup>3</sup>, of raw wood panels – 1.3 million m<sup>3</sup>, Veneers – 59.1 thousand m<sup>3</sup>, cut – 53.0 million m<sup>2</sup>, parquet wooden shields – 605 thousand m<sup>2</sup>, wooden windows, doors, frames and thresholds – 2.4 million m<sup>2</sup>.

Today, leading processors and manufacturers of wood products are: Krono-Ukraine LLC, Kronospan UA LLC, Korosten MDF Manufacture PJSC, SwissPan Limited LLC, "Kostopil plywood plant" LLC, "Brodivs'ke lisove gospodarstvo" SE.

Thus, in the development of the internal market of wood-date there are following trends: the development of new types of import-substituting production, including production of modern wood tile materials and Wood chemistry products; overcoming of the shortage of raw materials (particularly for pulp and paper industry); creation of favorable conditions for European import equipment and technology, which is a prerequisite for modernization of the sector; reduction of energy intensity by industry to generate energy from renewable wood sources, the development of biofuels; use of international technical assistance grant for the implementation of innovative energy-saving projects, access to donor funds, consulting assistance.

In order to produce competitive products, woodworking enterprises require significant investment to restore technology processes as well as implementation of modern management systems etc. The main obstacle for implementation of new technology processes and equipment for woodworking enterprises in Ukraine is lack of funding. Own funds are the main source of investments in the wood processing sector of Ukraine. Their share in 2014 was 95.4%. Financing of innovative work occurred only twice from the state budget in the last decade, simultaneously their share was only 0.05% in 2012.

The volume of capital investments of woodworking enterprises was 2.6227 billion USD in 2015, their share in overall structure of investments in the industry remains very low -3.0% in 2015<sup>4</sup>. Attraction of foreign investments in the wood processing sector of Ukraine is a promising but risky direction as the investment climate in the country is unfavorable, and the risk of investment in economics is significant. The majority of foreign investment in wood processing is directed to Romania, Belarus and Russia. In Romania, near the border of Ukraine, a new plant of chipboard company Egger (Austria) was built. Next to this plant there has been an increase in sawmill production capacity of 1 million m<sup>3</sup> of timber per year by the company "Schwaighofer", the waste of which will be used as a raw material for the production of particleboard. Second powerful particleboard plant was built by the company "Kastamonu" in the Mures County and is also located very close to the border of Ukraine. Significant investments in construction of particleboard factories in Belarus and Russia were made by the company "Kronospan" (Switzerland). All of these companies considered the possibility of investing in Ukraine, but due to big risk, abandoned these projects in favor of other countries[S. Sagal, 2014].

Therefore, the primary objective is the restoration of a favorable investment climate. Effective tool for this is the introduction of a system of state guarantees, improvement of the quality of the institutional environment; macroeconomic stability; sustainable reduction and maintenance of low inflation; implementation of environmental and social standards.

The creation of clusters as an effective form of public-private partnership, which has already been successfully tested in other countries will contribute to the solution of investment problem of woodworking industry. Woodworking cluster allows you to combine the efforts of the wood processing enterprises, regional Executive authorities and local governments, financial institutions, educational and research institutions to establish partnerships for relatively expanded reproduction potential of woodworking and raising funds for investment needs of industries. The cluster creation involves the grant of both resources and budget. Besides, its implementation will involve all stakeholders: the government, wood processing enterprises, and public organizations. As a result, the cluster will promote deep processing of timber in the region, will attract new investment in the industry and increase the competitiveness of local producers.

Important for the modernization of the woodworking sector is the woodworking collaboration of producers within a cluster that allows the use of financial and technical international assistance, as this was a Cluster of wood and furniture production. Association of producers received the support of the RERAM project from the EU and economic development agencies, Knowledge Networks, thereby creating the Council of the forest sector, which performs the functions of the Advisory body of the state administration and develops strategic plans for the development of the industry, conducting activities to increase the efficient use of forest resources, studying the social and environmental aspects of forest sector development and also gives recommendations and advises stakeholders on the correctness of management decision-making<sup>6</sup>.

The basic needs of the woodworking industry: the establishment of an effective mechanism of procurement of wood raw material for the organization of the wood market and the establishment of clear and understandable rules of realization of wood; the formation of a leverage of influence for creating products with considerable added value, that is, the development of deep wood processing in the country and not exporting it as raw material to foreign producers; – enforcement of transport tariffs, in particular, railway transportation for domestic transportation in accordance with the transit and the introduction of a moratorium on

<sup>&</sup>lt;sup>6</sup> The cluster of wood and furniture production [Electronic resource] – Retrieved from: http://www.domv.lviv.ua/ wpfc-forum-2015 [accessed: November 2017].

their improvement; an innovative update material-technical base with the aim of reducing production costs and bringing the product quality up to international standards.

One of the painful problems of the sector is staff capacity. Of utmost priority is the training of human resources and, in particular, of our young people. Migration of young skilled workers, stagnation vocational education, discrepancy young professional's knowledge and skills to manufacturers etc. All this makes the importance of reforming staff training, both at the level of enterprises, regional and state management.

The incentive mechanisms for woodworking industry:

- the establishment of an equitable partnership relations between forestry and wood industries on the basis of the formation of a market-oriented mechanism for the procurement of wood for the purpose of stability in raw material supplies to domestic wood processing enterprises;

 reorientation to production of goods with high added value through the legislative, institutional and economic and financial incentive mechanisms;

- development of ecologically responsible consumption of forest products;

- improvement of the national procedures of establishing the origin of timber in accordance with international standards;

 introduction of uniform system of electronic accounting of timber and revising trade rules to facilitate equitable market access for producers;

- promoting the use of wood in construction;

- ensuring of equal, non-discriminatory conditions for the use of wood, using it as raw materials;

– the introduction of the dual system of training workers for the wood industry. This implies greater cooperation of producers and educational institutions and training companies' production programs for its employees.

The furniture industry is one of the most dynamic sectors of the processing industry. In Ukraine there are more than 1.4 thousand enterprises with about 35.6 thousand workers, producing more than 12.5 million pieces of furniture for various purposes, which are supplied to the domestic and foreign markets. By size of enterprises on the market the industry is dominated by small businesses – they share 91.7% of the total number of enterprises in the industry. Due to falling demand for furniture through their significant rise over the last two years Ukraine has seen a reduction in furniture manufacture: by 1.6% in 2014 and by 12.4%

in 2015. Leading furniture manufacturers are "Modern-Expo",CJSC "Novyi Styl Ukraina", "Morgan Fenice" LLC, "Art Prom" LLC, "Mebel Service" LLC.

**Industry needs:** the reorientation of domestic manufacturers on production of furniture of an average price category, which remains a demand for domestic and foreign markets; development of domestic production of progressive construction materials, in particular wood-fiber plates of average density (MDF), the use of which as a construction material will significantly reduce the consumption of materials and cost of furniture and, respectively, improve the efficiency of production and competitiveness of products; the elimination of shadow-producing of furniture, which promotes unfair competition and negative impact on the economy of the state.

## Mechanisms of influence on the functioning of the industry:

- cooperation with public authorities to improve public policy and increase of investment attractiveness of the furniture industry;

- promoting liberalization and deregulation of business;

- contribution to the improvement of existing tax rules and VAT refund procedure;

- optimization of the rates of import duty on furniture;

- abolition of anti-dumping quotas on imports of particle boards;

improvement of provision of the enterprises with domestically produced materials:
 chipboard and MDF, furniture, varnishes and paints;

the implementation of the strategy of import substitution through increased knowledge-intensity of products and the commercialization of scientific discoveries;
promotion of establishment of a timber industry cluster, which encompasses the manufacture of wood and products of its processing, paper and cardboard, furniture, printing and associated equipment that will provide a competitive advantage over major trading partners.

The domestic chemical industry has always been regarded as a key industry because of chemical production in Ukraine was developing quite dynamically and at a rapidly growing rate, especially in the sectors of nitrogen chemicals and fertilizer production. Investment attractiveness and financial viability of the domestic chemical industry is closely connected with the price fluctuation in world markets. The collapse of the value of energy as a global trend, fall in the domestic economy, increasing turbulence in the global economy and lower demand in foreign markets are the main factors that reduced the cost of chemical products, which also affected the reduction of efficiency of chemical plants. Modern profile of a high-tech chemical industry of Ukraine is formed, first of all, by the enterprises of nitric directions, which are part of OSTCHEM Group. The Group consolidates four Ukrainian enterprises of chemical industry (PJSC «Concern Stirol» (Gorlovka) and PJSC "Azot" (Cherkasy), PJSC "Rivneazot" (Rivne), PrJSC "Severodonetsk Azot Association"), the largest distribution network of PrJSC «UkrAgro NPK» and Specialized Seaport Nika-Tera, Ltd. Four industrial giants of the country for the production of nitrogen fertilizers that produce ammonium nitrate and UAN, today, through a complex crisis in the country lost a significant part of their production. In addition to the OSTCHEM Group's enterprises, the market environment in the production of fertilizers was created by other powerful domestic producers PJSC SUMYKHIMPROM, PJSC "DNEPRAZOT", PJSC Odessa Port Plant and others.

The sector structure of the chemical industry is dominated by manufacturing of chemicals and chemical products, which is represented by 164 large and medium-sized enterprises and 1161 small business, which today employ around 80 thousand people (2014). The specificity of the market of chemical substances and chemical products is characterized by some peculiarities, because the share of sales volumes of production in large enterprises in 2014 was 61.8% (and in 2011 it was 72%), while the share of these enterprises in the market structure decreased to 0.8% (from 2.8% in 2013).

**Specifics of development.** Chemical industry of Ukraine annually can produce more than 5 million tons of ammonia, about 4 million tons of urea, 2.5 million tonnes of ammonium nitrate, more than 1 million tons of urea-ammonium nitrate, about 200 thousand tons of ammophos. There is a great demand for complex fertilizers, to the tune of approximately 1 million tons per year, but the domestic industry can supply the domestic market with these products at no more than 600 thousand tons per year.

The industry has always been export-oriented – export share of chemical products in total exports of goods amounted to 12-13%, but in the last 5-7 years, it was reduced to 6-8 percent. In the foreign trade Ukraine has undergone significant changes in 2014, which were characterized by a significant reduction in total export volume by 13.5% (or 8392,4 million USD), including export to CIS countries – by 31.3%. Despite the considerable devaluation of the hryvnia that has led to negative foreign trade balance – -468,3 million USD. The most important factor in decline of exports has become a serious political conflict with the Russian Federation and the loss of export-oriented industrial enterprises of Donbass and Crimea.

The industry is changing for traditional Ukrainian export markets: there has been a gradual narrowing of the markets of ammonium nitrate through a large number of tariff and

non-tariff barriers in the markets of both developed and underdeveloped countries; the changing structure of the market of mineral fertilizers due to the reduction of the nitrogen exports and exports of urea. The supplies of fertilizers, particularly ammonium nitrate in the domestic market is constrained by the peculiarities of the domestic taxation. The development of sub-sector is also affected by the increase in rail freight rates and tariffs for freight forwarding services. Therefore, in the situation of economic fluctuations and market changes on main export products of the Ukrainian chemistry, it should be noted that an increasingly important role is played by economic, political and technological factors in the reproduction of the competitive environment, which will ensure the effectiveness of macroeconomic policy.

Factors facilitating/deterring the development of the industry:

• the main competitive advantages for the Ukrainian chemical industry today are the geographical location, the availability of modern chemical plants, transport infrastructure, developed network of railway lines and ports, cooperation of enterprises, the locality and compactness of the concentration of production;

• potential growth of chemical industry of Ukraine is impossible without strong scientific capabilities. Leading agencies: "Cherkas'kiy NDITEHIM" SE, "STC ALVIGO" LLC, "Himtehnologiya" LLC, "VNDIHIMPROEKT Institut" PJSC, "State Research and Design Institute of Basic Chemistry "NIOCHIM" have experience of techno-economic studies and scientific information activities in the field of applied chemistry and chemical technology;

• the main risks lie in the political and financial instability in the country, the growth of administrative pressure on the industry, the curtailment of production at the marginal and adjacent territories.

For several years there was a decline in the production of chemicals and products: if in 2011 the index of production amounted to 128.0%, in 2012 – to 96%, 2013 – to 83.1%, in 2014 – to 85.8%. In a number of key products of the chemical industry, domestic producers lose competitiveness even in the domestic market. The main issue that explains the backwardness of the chemical industry, can be considered the following: import dependence of the country on the whole range of complex fertilizers and the lack of competitiveness for these types of products; adverse pricing environment on the global and domestic market of raw materials, intermediates and final products; high prices for raw materials, energy and growth of railway tariffs for cargo transportation; high capital intensity and the cost of maintenance of fixed assets, a long payback period of the investment; low availability of financial resources and high tax burden on the enterprise sector; insufficient development

of system of standards and quality control of chemical products; insufficient development of human resources, technological potential of the chemical industry; the increased competition for markets, for sources of raw materials; changes in conditions of production and relations of production.

The needs of the industry. There is an urgent need for the implementation of enterprise industry investment and innovative projects directed on modernization of the chemical complex with the target material energy saving and modernization with the aim of saving energy and reducing consumption of expensive raw materials and reconstruction of existing facilities, establishment of production of new products with high added value based on deeper processing of domestic raw materials of natural origin and industrial chemicals, providing chemical products to the domestic market and improvement of inter--sectoral cooperation, development of import substitution in the industry, harmonization of national database of standards with international standards.

In terms of the Association Agreement with the EU, it becomes important to implement a complex of organizational, technical, financial and economic measures for the further development of enterprises and provide chemical products to the domestic market; to optimize domestic raw material base due to the growth of import dependence on certain types of raw materials, minerals, gas, etc.; to incur legislative regulation of problematic issues regarding the establishment of preferential conditions to attract investment of financial resources and domestic support. Priority is given to attracting investment for the modernization of the chemical industry.

**Mechanisms of influence and priorities of neo-industrial development.** Given the need for revitalization of the domestic market of chemical products, priority should be given to projects for expanding existing production capacities and modernizing domestic production on the basis of deep processing of raw materials – domestic chemical products, nitrogen chemicals, organic destinations, titanium products, including:

• introduction of measures for the revival of our own raw materials base, in particular, contribution to the development of primary resources in the Lviv and Ivano--Frankivsk regions (reserves of potash ore to 6.8 billion tons), the resumption of potash in the amount of 300 thousand tons/year (with the prospect of increasing production to 1.0-1.3 million tons/year) at "POLIMINERAL", Stebnic'ke Derzhavne Girnicho-himichne Pidpriiemstvo, PJSC; development of Kropyvensky deposit of phosphorus-titanium ore;

• organization of production of new products instead of imported ones by deep processing of raw materials and products, which can be used to produce marketable products with a higher added value. Implementation of projects on modernization of production of caprolactam, adipic acid, ammonium nitrate, urea (domestic projects (more than 30) for 10 years was tested on the plants of Russia, Belarus, Bulgaria, Lithuania, China, Uzbekistan, etc.); construction of plants for production of soda ash as raw material for the glass industry (based on raw material resources cities Kalush, Slovyansk);

• increase of product competitiveness in domestic and foreign markets through the modernization of existing businesses, renovation, infrastructure under the new economic model that Ukraine will provide economic growth and will lay the background for future structural changes of material production in the country. In particular, the implementation of projects on modernization and reconstruction of production of some mineral fertilizers (PJSC "SUMYKHIMPROM"); the construction of plant for production of sulfuric acid reconstruction of equipment for the production of phosphate fertilizers (PrJSC Dniprovs'kiy Zavod Mineral'nih Dobriv); the construction of new units for the synthesis of ammonia and production of lime-ammonium nitrate (PJSC "Rivneazot"); modernization and reconstruction of plants for the production of ammonia and urea, UAN, caprolactam, reconcentrado nitric acid (PJSC "Azot");

creation of appropriate conditions for the stable development of production of mineral fertilizers and the needs of the agricultural sector of Ukraine in agrochemicals and plant protection, the necessary assistance in the harmonization of the draft law of Ukraine "On stimulation of development of industry producing mineral fertilizers, plant protection products and other agrochemicals for agriculture";
increase of capacity for the production of titanium dioxide of improved grades at PJSC "SUMYKHIMPROM", for which the company requires the construction of 1 km of additional operation space. Modernization of production will allow the company to produce 3600-3800 tonnes of brand assortment of titanium dioxide of improved quality.

The priority directions of import substitution can be plants that produce high-tech science-intensive products, in particular, the development and application of new complex fertilizers of prolonged effect and enriched with vital micronutrients, complex fertilizer with set properties in advance.

The scenario of modernization and innovative development in production of basic chemistry involves the encouragement of diversification of production and improving the competitiveness of the chemical industry. The implementation of this direction will contribute to the development of the chemical industry, which must include measures to attract investment. One way of attracting investment is the inclusion of plans for the modernization of chemical production in the Strategy of modernization of economy of Ukraine with the prospect of using the opportunities of the European programs (European technology platform, Horizon 2020, NoGAP), aimed at the creation and transfering of scientific achievements of the businesses. In particular, the EU launched the project grant agreementNoGAP to improve cooperation in the transfer of licenses, joint ventures, trade transactions, and gain access to international finance. The idea of the project is that those who require technology, refer to the coordinator of the project applications to receive them, and those who are technology providers (mostly people from Germany and other EU countries) send the message to the coordinator of the proposal on the transfer of technology. European technology platform "Steadfast chemistry" forum, which brings together industry, science, public authorities and a range of other interested organizations. The largest framework programme of the European Commission Horizon 2020 (designed for 2014-2020) brings together all existing EU programmes for funding research and innovation and enables the Ukrainian scientific--research organizations to take advantage of their benefits and to obtain grants offered by the European research Council.

The pharmaceutical industry is an important component of the formation of hightech potential of Ukraine. The domestic pharmaceuticals industry is developing dynamically and is the leader of the European vector of integration in the country as long as it is focused on production in accordancewith European standards of manufacturing, distribution, laboratory practice, and the like. However, the industry is in need of structural renovation, modernization, introduction of innovative technologies, improvement of the regulatory and legislative framework.

Economic activity in the production of pharmaceutical products is focused mainly on large and medium-sized enterprises. The highest dynamics of growth is shown by large enterprises – their share in the market structure in 2014 increased to 2.8% compared to 1.3% in 2011, while the proportion of employees of large enterprises amounted to 33.8% in 2014. The share of large enterprises in the volume of sales is increasing. Such trends indicate an increasing level of concentration of production in large enterprises and create conditions for

the redistribution of the pharmaceutical market among the major domestic players in the direction of the dominance of large enterprises.

Pharmaceuticals is one of the most promising areas for attracting investment. Taking into account year 2014, from the point of view of the emergence of acute economic and political problems in Ukraine, the volume of capital investment in the industry rose by 19.7% compared to the previous one.

Ukrainian manufacturers produce mainly generic drugs and are unable to compete with international producers in the creation of original products. The leaders of the Ukrainian pharmaceutical industry are: JSC "Farmak", pharmaceutical Arterium Corporation, PrJSC "Pharmaceutical company "Darnitsa", PJSC SIC "Borshchahivskiy chemical pharmaceutical plant" (Borshchahivskiy CPP)", Public company "Kyiv Vitamin Factory", "Pharmaceutical company «Zdorovye»" LLC (Kharkiv), PJSC "PHARMSTANDARD-BIOLIK" (Kharkov), "Ukrainian-Belgian InterChem SLC" (Odessa), "Ekofarm", Zhytomyr Pharmaceutical Factory LTD, "Fitofarm".

#### Factors promoting the development of the pharmaceutical industry:

• industry remains stable and keeps positive economic growth rate over a long period, but in 2015, the industrial production index stood at 92.4% compared to the previous year;

• a fairly high level of harmonization of the legal and regulatory framework with the relevant European directives and EU norms;

• pharmaceutical business, as a growing and recession-proof sector, is attractive for investment. An example of this interest is long-term cooperation of the European Bank for Reconstruction and Development (EBRD) with the pharmaceutical company "Farmak", which has attracted more than 600 million euros for projects on modernization of its production over the last 2-3 years. Since 2016, the EBRD has started cooperation with 5 pharmaceutical companies in Ukraine;

• the industry has potential for development, which is determined by the existence of a significant historical experience of the domestic production of sera and vaccines, the current scientific school of Microbiology and Virology, a solid research base for the production of generics.

**Peculiarities of development**. In 2012 the Law of Ukraine "On Ukraine's accession to the Convention on the elaboration of a European Pharmacopoeia" was enacted. According to this law, Ukraine has received the status of a member of the European Pharmacopoeia

Commission, and, therefore, the European quality standards of drugs became mandatory. All 115 companies in the pharmaceutical industry has got the GMP ("Good manufacturing practice") certificate, which allows them to export the products to many countries of the world. Since 2011 the implementation pilot projects on introduction of state regulation of prices for medicines for the treatment of patients with hypertension and regulation of prices for insulin is being continued. The formation of competitive market relations is closely connected with the conduct of the deregulation of the pharmaceutical market, which is the simplified registration procedure for medicinal products, simplifying licensing procedures, abolition of licensing imports of active pharmaceutical ingredients (APIs) and the like.

## Key trends in the pharmaceutical market of Ukraine in 2013-2015:

– globalization of the pharmaceutical products market, which is evident in such phenomena (changes in commodity markets (formerly the raw material was purchased in India, China, and now in Europe and other developed regions); the interest of major pharmaceutical companies in the production of generics through the support of the government and of the state in relation to the production of biological products, oncological drugs and drugs for the treatment of cardiovascular diseases etc; domestic pharmaceutical companies prefer to do research and marketing, however there is a trend to use outsourcing for testing or production);

- technological progress contributes to the fact that the pharmaceutical market of Ukraine is of interest to investors because of the opportunities to create new components;

– significant is the impact of the policy of import substitution on the balance of market power between pharmaceutical companies, when in recent years the share of domestic producers in the market significantly increased compared to the share of foreign companies (up to 37% (2015) vs. 28% (2011) in monetary terms). At the same time hard inflation of this period and the devaluation of the national currency, which create excessive pressure on the industry, lead to lower consumption of drugs and expensive replacement of medicines with cheaper ones in the pharmaceutical segment due to the low purchasing power of the population;

strengthening the actions against smuggling of drugs and the introduction of new rules of certification (as 18.08.2016 to the "State register of medicines of Ukraine" of the Ministry of health included information on 12814 BOS, of which: domestic – 3857, foreign – 8957). The main innovation of 2013 was the mandatory labelling of drugs according to GMP standards, which involves passing the mandatory special

certification of production capacity for all producers of medicines. As a result, at the beginning of 2016, the number of domestic manufacturers in the pharmaceutical market decreased to 115, the ones has who received a license for production of medicines (compared to 140 in 2010);

– coming into force of the new import licensing (from 01.12.2013). Among the main requirements for importers of pharmaceutical products: importers must introduce detailed operating procedures within the quality control system, implement risk management systems, implement laboratory analysis of imported medicines and renewal of contractual relations with foreign manufacturers and suppliers, quality control and pricing of drugs;

- in 2015 the system of procurement of drugs was modified and transferred to the competent international organizations, in particular WHO and UNICEF, which improved the transparency and openness of the state procurement system.

**The problem of development**. The interest of international investors to the sector is constrained due to the instability of the legislative and legal system, especially through frequent changes in tax and customs law, and the regulation of the Ukrainian pharmaceutical market.

The development of pharmaceutical industry slowed down due to lack of reforms of the national health system and the absence of a National strategy of healthcare development in Ukraine.

The industry is export-oriented mainly on the countries of the former Soviet Union. The main supply destinations are Uzbekistan, Russia, Kazakhstan, Belarus and Moldova. During the analyzed period the share of exports of pharmaceutical products in total exports did not exceed 0.4%, while the proportion of imported pharmaceutical products in total imports is quite significant – about 4%. Effective for lifting the economy of the pharmaceutical industry should be the promotion of production of goods for export to European countries, the main vector of development is the question of access to the European markets.

There is a high dependence of the domestic pharmaceutical companies on imports of intermediate goods such as substances, AFI, which are the source for the production of the final product. There are prerequisites for the start of production of the basic substance which can be produced on an industrial scale, but there is a requirement only for new technologies and large investments.

There was not a single original drug (new molecule) registered over the last 20 years in Ukraine. These trends regarding the lack of new own research developments in the pharmaceutical drugs inhibit the processes of modernization in the industry, and threaten by lagging behind the leading countries in the production of high-tech products and increase of purchases of imported analogues.

The possible strengthening of the state regulation and control in the pharmaceutical industry in Ukraine may lead to the restriction of profitability of the pharmaceutical business. Ukrainian pharmaceutical companies again faced problems that were typical for 2009-2013, namely: the high cost of credit and investment resources necessary for the implementation of development projects and expansion of production capacities, which amid increasing competition in the market, leads to a worsening shortage of working capital funds of pharmaceutical enterprises.

**The needs of the industry**. For the solution of problems with raising funds to expand activities of pharmaceutical companies it is important to take the following steps:

– assistance concerning the possibilities of obtaining soft loans for expansion and innovative development of enterprises (public-private). Now innovation is happening at the expense of attraction of own funds (reinvestment) in the development of enterprises in all sectors of economic activity;.

– improvement of the tax legislation to reduce tax burden arising from the import into the customs territory of Ukraine with a modern, innovative, high-tech equipment for creation of new and modernization of existing capacities of pharmaceutical enterprises, and the establishment of a system of tax incentives for exporters.

Effective direction of development of innovative activity on the basis of the experience of most industrialized countries is the development of technology parks initiated as innovative policy to promote the production of competitive goods. Implementation of innovative and investment projects of technoparks in the pharmaceutical industry is represented so far by only one ongoing project, information about which is available on the website of the State Agency for electronic governance of Ukraine (registered on 18.05.09, the project of Industrial Park "Development and introduction in production of new import-substituting finished pharmaceutical products" (SSI "Institute for Single Crystals", Kharkov, contractor – Farmak JSC). Perspectives and creation of new technoparks with pharmaceutical direction in Ukraine are closely connected with improvement of the legislation on the issue of financial support, targeted subsidies of the state and opportunities for the provision of technical assistance to encourage the development and production of innovative drugs and

creation of conditions for localization of pharmaceutical production in order to be embedded in the global industrial chain.

In the context of the implementation of conditions to promote the innovative development through the provision of technical assistance from the EU, it is necessary to create conditions for implementation of modern methods and technologies economically feasible for processing large volumes of data with the purpose of obtaining information, which not only affects the development of the pharmaceutical business and increases its profitability, but also deepens the scientific and innovative component of applied pharmaceutical research.

There is also the issue of improving research and production potential of the industry for the development of venture projects in pharmacology. Foreign investors have noted the presence of skilled human capital capacity in Ukraine, the relative unemployment on the market, and the availability of government programs to support business in the pharmaceutical field. Also taken into consideration that the Ukrainian production facilities have significant potential to increase where possible to produce a wide range of pharmaceutical products using the latest international recipes. At the same time, improvements require qualitative indicators of medicines, production portfolios and knowledge of professionals working in the industry. To restore the growth of the pharmaceutical sector, state investments in education, training and retraining become an important area.

The mechanisms of influence on neo-industrial restructuring of the pharmaceutical industry. Companies in the pharmaceutical sector that focus on the implementation of scientific research and experimental-design developments and the development of high-tech export-oriented products should:

• ensure the development of innovative pharmaceuticals with the focus on the domestic market. It is necessary to increase R&D expenditure to 10% of the turnover of manufacturers of pharmaceutical products; to stimulate industrial growth in the domestic pharmaceutical market by providing financial incentives to pharmacists who have generic drugs. In particular, the implementation of innovative measures for the economical use of energy resources and improving the quality of products is provided on the ELFA Pharmaceutical factory andBiovetfarm PJSC; the development of new types of products at LIKTRAVY, PrJSC;

• through amendments to the Law of Ukraine "On medicines" (regarding the transparency of production and safety of medicines) No. 1199 dated 02.12.2014, and

the adoption of a new edition of the Program of protection of domestic producers, develop mechanisms and ways of integration of domestic pharmaceutical industry in the global industrial chain of production (in terms of stimulating the creation of technology parks for the development and production of innovative medicines; creation of conditions for localization of production and search of possibilities of construction in Ukraine of a large foreign pharmaceutical companies factories with full (complete) cycle for the production of analogues of imported drugs or increasing their capacity in existing plants). In particular, the construction by Company "Biopharma" of new modern SPC "Biopharma" (2016) has become an example of fruitful cooperation with foreign companies. This is the first biopharmaceutical manufacturing plant in the country built from scratch in recent years in Ukraine. Investors are the American company Horizon Capital and the Dutch development Bank FMO (for 1.3 years it has invested more than 40 million USD). The plant was designed by Linde Engineering (Germany), an international engineering company with extensive experience in the pharmaceutical industry, and meets current regulatory requirements and the requirements of GMP (Good Manufacturing Practice);

• ensure the development of domestic production of the API. The solution to this problem can be implemented in the SME, and in this entrepreneurship sector opportunities are created in two segments: manufacturing of the API for the local market (through the attraction of foreign technology and the establishment of production on the territory of Ukraine) and the production of APIs for major pharmaceutical companies (manufacturing of chemicals, which are used by large multinational companies);

• stimulate the creation of new competitive dynamic of clusters and industrial parks with the development and production of innovative drugs (in particular, such as the investment project for the creation of a new production of active pharmaceutical ingredients in the Industrial Park "Svema" (manufacturer – Farmak JSC). Positive experience of European cluster models of regional economic development in the sphere of pharmaceutics and biotechnology is the Scandinavian cluster, which brings together four regions (Turku, Finland; Oslo, Norway; Gothenburg, Sweden; Copenhagen, Denmark). The cluster implemented a number of promising research projects aimed at solving problems in the field of treatment of cardiovascular diseases, Oncology, as well as the creation of biomaterials and healthy technologies.

The essence of this project lies in the significant public and governmental financial support programs of the cluster partially on national and partially on regional levels; the implementation of cluster programmes and regional strategies that involve budget allocations and targeted grants, benefits and other preferences; help to priority cluster structures through the implementation of the strategy on principles state private partnerships; the establishment of the strategic centers of national level and a significant number of long-term initiatives in support of cluster development; close cooperation between academia, pharmaceutical companies and authorities that deal with health care;

• facilitate the implementation of the transformation process control in the industry and support it, as well as the formation of new principles of business administration, approaches to the development of IT systems and introduction of new tools of interaction. A key segment for the development of pharmaceuticals in Ukraine should become a research activity (R&D). The approach to development in the pharmaceutical industry today is the concept, which is based on the business process from idea to the market launch, and therefore everything connected with the ideas, trends, new trends, production tests, communication with suppliers regarding quality and supply, clinical testing, certification and registration of substances and drugs in government structures and plans to bring the product to market;

• contribute to the training of specialists of laboratory work, familiarize them with the latest technologies and modern professional equipment, pharmaceuticals, laboratory medicine, veterinary medicine; provide training in master-classes on operating equipment with the possibility of personal testing, obtaining consultations from experts of the industry, introduction of new techniques and methodologies in pharmaceutical industry, medicine and science;

• assist in the creation of platforms for meetings between entrepreneurs and investors, venture capital funds and business incubators, with the goal of providing greater opportunities to the owners of capital on the choice of objects for investment;

• enter certain privileges (a tax value-added (VAT) refunds for exported pharmaceutical products, guarantees and credit protect exporters against the risks of preferential credit terms to encourage the development and production of high-tech pharmaceutical products, the provision of incentives for new enterprises for production of medicines, including the import of new high-tech equipment and the like).

So, to sum up we can say that the formation of an effective state policy for neo-industrial transformation of industrial production requires the following activities of neo-industrial effects:

• creation of conditions for the opening of production on the basis of use of own raw materials and deep processing of raw materials;

• implementation of major infrastructure and innovative projects of modernization of existing enterprises;

• facilitation of the development of new high-tech industries and new products, promoting innovative development by introducing technological and product innovations;

• focus on import substitution of industrial goods by establishing import-substituting production;

• improvement of customs policy instruments;

• creation of conditions for development of small and medium business with the aim of increasing their level of innovativeness and capability of localization of production of high-tech products in Ukraine;

• support of the development and implementation of new organizational forms of industrial parks and industrial clusters as effective forms of public-private partnership;

• improvement of regulatory policy;

• creation of conditions for development of small and medium businesses with the aim of increasing the level of innovativeness of SMEs and the opportunity to become part of the global supply chain;

• improve the system of public procurement;

• modernization and expansion of existing facilities and construction of new facilities in compliance with the EU legislation concerning the safety and quality of products;

• promotion of the creation of industrial parks, regional and industrial clusters, technological platforms;

• improvement of access to new markets, particularly EU markets;

• training and strengthening of relationships with science;

• acceleration of harmonization of standards in accordance with international standards of safety and quality of products, the introduction of the enterprises to the international safety management system;

• focus on import substitution of industrial goods by establishing import-substituting production;

• promotion of localization of production/construction of large plants by foreign companies;

• improvement of customs and tax legislation.

Thus, we have identified the features of the sectoral policies targeted to specific groups of products. The types of sector policies depend on the characteristics of production and sales of goods. Thus, fastest access to infrastructure, reducing investment and operating costs and the restriction of export of strategic raw materials should become the components of the policy in relation to the production of standard industrial goods. For goods that are produced in the chains of added value controlled by foreign multinationals, the policy must provide for the existence of the free customs zone regime, the promotion of investment. Common features which determine the specificity of the industrial enterprises, that produce, in particular, investment goods, is the presence of technological (production) chains and the production of useful products. For goods, in production of which Ukrainian producers retain control of chains of added value due to R&D, are important measures to support exports, stimulate domestic demand (infrastructure projects, public procurement) and conjoined government R&D funding.

**Conclusion**. Given the above, regulatory impact assessment of industrial policies (based on the analysis of characteristics of targeting certain industrial groups) allows us to determine the basic mechanisms of influence and priorities of neo-industrial development of the industry:

• provide the priority of implementation of investment projects to expand existing production capacities and modernize domestic production on the basis of a deeper processing of local raw materials and intermediates, the use of modern technologies, creation of closed technological cycles of production;

• facilitate the organization of new modern processing industries and create new products through the implementation of tasks in the implementation of projects for the development of modern import-substituting industries, which are capable of producing competitive commodity products that are not inferior to foreign analogues, on the basis of introduction of modern technologies, promotion of production localization on the territory of Ukraine, cooperation for the organization of joint ventures;

• support the entry into global value chains through: conducting applied research and development work in the interests of the foreign customer; cooperating in the organizational and technological process with foreign suppliers;

• create integration structures and innovative organizational forms: industrial and technology parks, clusters, cross-border associations;

• stimulate diversification and improve competitiveness of domestic products by progressive integration of Ukraine to the internal market of the EU, overcoming technical barriers of trade between Ukraine and the EU; take measures to improve the level of harmonization of technical regulations and national standards with international and European ones;

• improve the system of education and science to provide the industry with highly qualified personnel; modernize the relationship and formation of new mechanisms of interaction between universities and businesses;

• use opportunities of European programmes to the create and transmit scientific achievements of the businesses.

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Abstract. The article examines the scientific vision of the development of Ukrainian industry as a key factor of the economic system that can be modernized and formed a basis for industrial growth, through which Ukraine will be able to achieve the global goals of sustainable development proclaimed by the 70th UN Assembly. The authors consider new approaches to diversification and integrated proportional industrial development with the possibility of preserving and restoring both traditional industrial manufacture. This might improve product quality and stimulate the development of production systems in accordance with international requirements and with the prospect of forming new high-tech and competitive sectors of industry, in particular chemical, woodworking and pharmaceutical. The main incentive mechanisms and priorities of the neo-industrial development of manufacture are proposed.

Keywords: sustainable development, industry, neo-industrial transformation, competitiveness