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CONCEPTUAL MODEL OF FORMATION OF THE ECONOMIC SUPPORT SYSTEM FOR STRATEGIC DEVELOPMENT OF THE BY-PRODUCT COKING INDUSTRY OF UKRAINE

Abstract. The necessity of forming an economic support system for the strategic development of the by-product coking industry in Ukraine is proved, which will allow justifying a set of effective actions in conditions of instability of the external environment. Its conceptual model is proposed, which is represented by the integration of the main block (based on the analysis of trends, economic and mathematical modelling of processes and forecasting of further development) and supporting block (contains a set of tools aimed at intensifying state support, institutional, marketing, information, innovation component of development) and provides for the participation of the state and other entities involved in the processes of strategic development at different levels.

Keywords: by-product coking industry, economic support, economic support system, strategic development, industry

Formulation of the problem. The by-product coking industry is one of the key industries, and its stable operation can influence the development of other industries and the national economy as a whole.

The problems and challenges faced by the by-product coking industry at the present stage have led to a significant drop in production volumes and a deterioration in key economic indicators. Thus, in 2022, coke production decreased by almost 2.5 times compared to last year [1].

The main reasons for this situation include a decrease in domestic coking coal production; a significant share of coking coal deposits and coke production facilities located in the temporarily occupied territories; the destruction of a number of enterprises as a result of Russia's full-scale military aggression; and the obsolescence of fixed assets. This situation requires systematic actions and an understanding of the main strategic priorities of development, including during the post-war recovery of the Ukrainian economy.
World practices prove [2; 3] that transformations in the by-product coking industry should be based on innovation and have proper economic support.

It should be noted that the formation of an economic support system for the strategic development of the domestic by-product coking industry in the conditions of martial law and post-war recovery should be carried out on the basis of a conceptual approach, which will justify a set of effective actions in the conditions of instability of the external environment, coordinate it with the general economic policy of the country, take into account global trends and existing sectoral potential. This determines the relevance of this study.

Analysis of recent research and publications. The problems of economic support for the development of industrial sectors, the analysis of various approaches and the formation of a methodological basis for such processes are given attention in the works of such researchers as: A. Chalabyan [4], Th. Chermack [5], S. Jha [6], L. Mendoza-del Villar [7], T. Niemann [4], E. Oliva-Lopez [7], C. O’Reilly [8], D. Rodrik [9], M. Yülek [10] and others.

The study of the development of industries and the by-product coking industry in particular, the identification of the main problems and threats faced by enterprises and the development of basic approaches to further transformations is devoted to the work of such researchers as: Shanying Hu [2], Jin Li [2], V. Malyna [3], V. Rudyka [3], P. Ulrich [11], T. Naegler [11] etc.

It should be noted that the issues of sectoral development and economic support of these processes are in the field of view of such international organizations that carry out and present to specialists and the general public research on the future development of various spheres of the economy, paying attention to the strategic consequences of such processes at different levels (global, national, etc.). Among them: International Energy Agency [12]; Organization for Economic Cooperation and Development [13]; World Economic Forum [14].

However, the issue of forming an economic support system for the strategic development of the by-product coking industry in Ukraine requires further study using a conceptual approach, taking into account industry specifics in accordance with modern challenges and threats.

Purpose of the study. Development of a conceptual model for the formation of an economic support system for the strategic development of the by-product coking industry in Ukraine, which is aimed at justifying a set of effective actions in the conditions of uncertainty of martial law and subsequent post-war recovery.

Presenting main material. The research results allowed us to state that the main tasks of the economic support system for the strategic development of the by-product coking industry in Ukraine are:

- improving the competitiveness of the industry by using the achievements of "Industry 4.0", recovery of economic growth in the industry;
- formation of the organization and functioning of the system of strategic development of enterprises of the by-product coking industry using economic tools;
- formation of mechanisms for coordinating the strategic development of the by-product coking industry;
- formation of innovative components of the economic support system, taking into account the provisions of the state economic policy, the policy of post-war reconstruction and global trends in industrial development.

It should be noted that the modern by-product coking industry requires new standards in the field of design and operation of coke production enterprises in compliance with the principles of sustainable development. The common efforts of science and production are the key to successful technological re-equipment and modernization of the by-product coking industry.

Based on the current situation, the industry's strongest trend today is the development of environmentally friendly production. In this part, both modernization of equipment, introduction of modern technologies, and in-depth processing of chemical coking products help to make production efficient.

In the process of post-war restoration of industry, special attention should be paid to the mechanisms of management of the ecological and economic system and be aimed at:
- minimizing the difference between the use and reproduction of resources;
- maximizing the quality of the environment;
- increasing economic efficiency;
- reducing the environmental intensity of production; using green technologies.

At the same time, it is of great importance to assess the impact of the ecological and economic system of an industrial enterprise and its varieties on environmental safety.

The implementation of a number of reforms aimed at reducing industrial pollution in Ukraine, the introduction of the best green technologies will make it possible to rebuild industrial facilities according to European standards, as well as attract the necessary investments from international financial institutions, one of the key conditions of which is the achievement of European environmental standards.

Separate provisions of economic support for the strategic development of the by-product coking industry should be:
- changing the standards of the by-product coking industry, updated technical regulation, standardization, metrology, modern management systems;
- creation of engineering and pilot infrastructure, ensuring the conduct of applied research;
modernization of production infrastructure and development of innovation activities.

When forming an economic support system for strategic support when monitoring and analysing the state of the industry, it is advisable to take into account indicative planning, which involves the formation of a set of agreed indicators that characterize the state and goals of economic development of the by-product coking industry, as well as carrying out balance calculations and developing measures based on them to achieve the goals and their resource availability.

Indicators used in the process of indicative planning are determined on the basis of the principles of measurability of goals and compliance of indicators with goals, characterize the degree and dynamics of achieving goals and implementing tasks of economic development.

The system of indicators used in the process of indicative planning is formed in accordance with the architecture of strategic development documents of the industry and ensures consistency of strategic planning documents developed within the framework of forecasting, goal setting, planning and programming, as well as at the regional level.

Updating of indicators is carried out taking into account the definition of new goals, achievement (non-achievement) of target values of indicators, as well as assessment of the need and sufficiency of resources, which is carried out, including using balance sheet calculations.

In order to form uniform initial data, ensure continuity, compatibility and consistency of indicators contained in strategic development documents, their calculation, calculation of target and maximum permissible (critical) values of indicators are carried out according to a unified methodology, it is necessary to use common approaches and methods for assessing, forecasting, and modelling the state of the by-product coking industry.

Among the organizational forms of the economic support system for the strategic development of the by-product coking industry, it is necessary to pay attention to intersectoral and public-private partnerships, which should be considered as possible means of improving the economic stability of the by-product coking industry.

Intersectoral partnership is one of the elements of the economic support system for the strategic development of the by-product coking industry and is implemented through an appropriate mechanism.

Important components of such a mechanism are:
- regulatory legal acts regulating the activities of the by-product coking industry;
- communication process between the parties to the partnership;
- strategies, technologies and procedures of the communication process that are necessary to coordinate the interests of the parties;
- development of optimal decision-making procedures and practices with the appropriate algorithm of actions;
- expert assessment, analysis of the interaction process;
- a system for monitoring the implementation of agreed agreements.

At the same time, the sectors of strategic cooperation will be the state, commercial and non-commercial sectors, within which partnerships are formed. Each sector is based on different priorities, values, competencies, expectations and work style. Through a successful partnership, individual opportunities, resources and competencies of each sector can be combined to achieve a common strategic goal.

The process of forming and implementing an intersectoral strategic partnership can take place at different levels: local (sectoral), regional (national) or international (transnational), which are determined by the motivational and target orientation of strategic interaction of business structures, as well as the level of development of their resources, competencies and capabilities.

Among the forms of functioning of intersectoral strategic partnership at the local or sectoral level can be vertical and horizontal economic relations in the form of mutual agreements, organization of industry clusters, outsourcing, co-branding. At the regional and international levels, partnerships are usually established in the form of joint ventures, strategic alliances, mergers and acquisitions of companies, network structures and franchising.

In turn, the use of forms of public-private partnership in the by-product coking industry is the key to the restoration and development of enterprises in the industry. It provides an opportunity to concentrate resources on priority areas of economic development and is a transparent and understandable mechanism for Western investors.

The main advantage of using public-private partnerships is the separation of opportunities, from assistance from international funds to working with private investors, which will provide an opportunity to speed up the entire process, because businesses will be interested in the rapid implementation of projects and receiving funds.

Among the main forms of public-private partnership, we should highlight: concession agreements; property management agreements; agreements on joint activities and others.

It should be noted that modern economic processes are highly dynamic. In such conditions, it is necessary to use flexible and effective marketing technologies, which are one of the elements of the economic support system for the strategic development of the by-product coking industry.

For each industrial enterprise, it is appropriate to develop flexible and adapted to market changes based on the production principle. Today, the use of digital
technologies and digital marketing tools is one of the elements of innovative development of industrial enterprises.

The list of marketing tools is quite wide, in particular: tools for developing communication, sales, pricing, product policies; tools for developing advertising and promotion policies; tools for accumulating primary information about the state of the market, its positioning and research of competitors' activities; high-tech tools (in particular, 3D marketing), etc.

Among the entire range of marketing technologies, it is appropriate to highlight the use of B2B marketing in the activities of industry, which has its own specifics and focuses on servicing other enterprises that purchase products for their own industrial purposes.

A strategic vision for the development of coke production enterprises, thorough knowledge of the needs of consumers of industrial goods and planning of marketing activities is the only way to achieve goals related to profit, penetration into new markets, and increasing sales.

The basic principles of industrial marketing as an effective direction of management in modern conditions include the following:

- free choice by market entities of their own goals of functioning and development strategy;
- adapting to the changing requirements of potential consumer organizations;
- targeted impact on the demand of various categories of customers for its proper formation;
- flexibility to achieve your goals and adapt quickly to changing environmental conditions;
- an integrated approach to solving problems, determining the purpose of activity, taking into account the available resources and capabilities of the enterprise [11].

Extensive use of marketing technologies will allow you to adapt to market fluctuations, provide an understanding of the needs of the consumer enterprise, and contribute to achieving sustainable profits.

We agree with the author that in the context of the new technological paradigm, industrial enterprises should focus their efforts on creating digital infrastructure, developing competitive skills and strengthening research potential [10].

Enterprises of the by-product coking industry should be transformed into digital industrial enterprises, while widely using the full range of digital technologies and innovative approaches. So, first of all, enterprises should function in the form of integrated information complexes of resources and processes using digital models, methods and tools that are interconnected by a common management system. Undoubtedly, digital transformation requires a significant restructuring of the management system and is a systematic and multidimensional process.
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Regarding the use of Information technologies at coke production enterprises, it should be noted that domestic enterprises have experience in integrating SAP program modules into their own activities, in particular:

- SAP Process Integration is used in the process of forming an integration management solution;
- SAP Master Data Management is the system for accounting for regulatory and reference information at the enterprise level;
- SAP Knowledge Management - knowledge management platform;
- SAP Business Intelligence serves as a platform in the context of creating enterprise data warehouses and business intelligence;
- SAP PPM (Project and Portfolio Management) provides automation of project management and project portfolio management processes;
- SAP Business Suite accelerates the development of a new product.

Among the effective technologies for managing the resources of industrial enterprises, the following should be highlighted: Enterprise Resource Planning (ERP), Supply Chain Management (SCM) and Customer Relationship Management (CRM) allow you to increase the efficiency of the enterprise, improve customer service and organize effective interaction with partners.

A single information space within the enterprise allows an integrated information environment to cover the product life cycle at all stages. In this context, the CALS program (Continuous Acquisition and Life Cycle Support) provides continuous information support for the entire life cycle and product delivery of the enterprise. At the same time, software tools and systems are used:

- product data management and its configuration (PDM – Product Data Management Systems);
- Project Management;
- task flow management when creating and changing technical documentation (WF – Work Flow systems);
- providing information support for products at the post-production stages of the life cycle;

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We emphasize that an effective economic support system as a separate component should take into account investments that are necessary for the restoration and strategic restructuring of the industry. Given martial law and the post-war period, security guarantees are the most important issue for potential investors. Therefore, there is an urgent need to create a reliable risk insurance system with the involvement of international organizations. Thus, one of the partners-guarantors can be the Multilateral Investment Guarantee Agency (MIGA) - one of the five institutions of the World Bank.

The main goals of the agency are:
- promote increased investment inflows to developing countries through the provision of guarantees, including insurance, for non-commercial risks;
- conducting research, collecting and disseminating information to promote investment;
- providing technical assistance to countries, conducting consultations on investment issues.

The use of conceptualization and a systematic approach to understanding the processes of economic support allowed us to deepen and argue the conceptual model of the formation of an economic support system for the strategic development of the by-product coking industry in conditions of uncertainty and present its structural schemes (fig. 1).

It should be noted that this model combines the main block of the economic support system for strategic development (which is based on the analysis of trends, economic and mathematical modelling of processes and forecasting of further development) and supporting (containing a set of tools aimed at intensifying state support, institutional, marketing, information, innovation component of development) and provides for the participation of the state (within the framework of state industrial policy) and other entities that are involved in the processes of strategic development at different levels (enterprises, sectoral national and international).

Conclusions. Thus, military actions in the country as a result of Russia's full-scale aggression caused significant problems for the domestic by-product coking industry, as well as affected the situation in the global energy, logistics and other markets with which the activities of this industry are directly related, causing failures in their functioning.

The economic impacts of such processes can lead not only to uncertainty in further transformations of an individual industry and the national economy, but also affect global economic development.

Obviously, it is extremely difficult to assess the impact and consequences of the war on global economic development today.
Fig. 1. Block diagram of a conceptual model for the formation of an economic support system for the strategic development of the by-product coking industry suggested by the author
However, it is already necessary to gain some understanding of the main strategic priorities of the post-war development of the domestic by-product coking industry, which will form the basis for further transformation processes using modern technologies and innovations in various fields and the formation of sound strategies. And the use of the proposed economic support system can create conditions for minimizing or levelling risks and using potential opportunities in the future.

Therefore, the presented conceptual model of the formation of the economic support system for the strategic development of the by-product coking industry combines a significant set of elements on the quality of formation and application of which depends on the increase in the economic efficiency of using the potential of coke production facilities, the efficiency of transformational economic processes in the post-war period and the economic growth of the industry in Ukraine.

At the same time, it should be noted that further functioning of the economic support system and performance of its functions is possible through the introduction of a number of organisational measures and involves the creation of an appropriate organisational mechanism for its implementation, which is the prospect of further research.

References:


