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Formation of environmental guidelines to ensure sustainable development of industrial enterprises

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Abstract. The purpose of this study is to form strategic environmental guidelines to ensure the sustainable operation and development of industrial enterprises. The paper focuses on carrying out a structural analysis of the environmental policy of Russian industrial enterprises, identifies factors influencing environmental conditions, and defines directions for the formation of a sustainable development policy. Environmental adaptation is based not only on legislative and management mechanisms, but also on the needs of end users for greening and balancing overall benefits and individual satisfaction. The paper emphasizes the need to meet environmental requirements throughout the entire chain of management process, which will ensure the sustainable development of industrial enterprises. The study concludes that such a system would increase the number of enterprises declaring environmental values.

1. Introduction

The concept of sustainable development, despite the existing criticism [1-3], is a promising form of economic systems' development, which is explained by the trinity of economic, social and environmental effects obtained by enterprises and society as a whole as a result of the implementation of this concept [4-5]. This concept influences the practice of both private companies and public institutions. The society is interested in this concept because it allows to ensure safe economic and social development based on the rational exchange and use of resources. The sustainable development of industrial enterprises determines the sustainability of the national economic system development and is an object of state institutional regulation [6].

Achieving sustainable development is the subject of discussion by international professional organizations and associations. According to the UNIDO report (Structural Change for Inclusive and Sustainable Industrial Development), the level of sustainable development of industrial enterprises is a key factor in economic growth in developing countries. Early development of manufacturing can open up opportunities for rapid and inclusive growth for these countries. The manufacturing sector plays an important role in growth, especially when countries are at relatively low income levels [7]. For example, the manufacturing industry has a potential for higher levels of productivity, and is able to



provide accelerated productivity gains with significant technological change as compared to other sectors of the economy.

Also in the manufacturing sector, jobs are being created that offer higher wages due to the higher levels of productivity achieved. Hence, there is a link between the growth of an economy and the growth of its manufacturing sector. This relationship tends to be stronger in low- and middle-income countries than in middle- and high-income countries, as productivity and employment in manufacturing, relative to other sectors, are expected to be higher at lower national income levels [8]. Industrial development can contribute to the development of more socially significant and technologically complex industries. This structural change ensures sustainable and accelerated industrial development even after the loss of the labour cost advantage.

The concept of sustainable development for an industrial enterprise is a productive business strategy that determines the approach to organizing and managing business [9]. The sustainability factor has been taken into account in the DJSI indicator (Dow Jones Sustainability Index) for more than 20 years and influences the company's capitalization as well as decisions made by investors and other stakeholders. ESG (Environmental, Social, Governance) factors assessing the sustainability and prospects of companies are currently being studied by market analysts no less carefully than traditional financial indicators.

Thus, the concept of sustainable development meets the requirements of the new information society, and business ensures its implementation in order to maintain current positions and development. The search for promising strategic guidelines that are adequate to market realities makes it possible to systematize and organize the directions of industrial companies' development, taking into account social and environmental outcomes.

2. Materials and methods

The article is based on the conceptual research method that relies on the study of academic literature to find and integrate various concepts, including aspects of sustainable development, strategic and operational management of an industrial enterprise.

Methods used at various stages of research include methods of mathematical statistics, expert methods, as well as classifications, comparative literature review and correlation of statistical and market research data.

The research used data from the official state statistics of Russia, which characterize the dynamics of development and environmental adaptation of industrial enterprises; data from ESG indices of the Moscow Stock Exchange, which are the basis to compare the level of sustainable development of the companies under consideration.

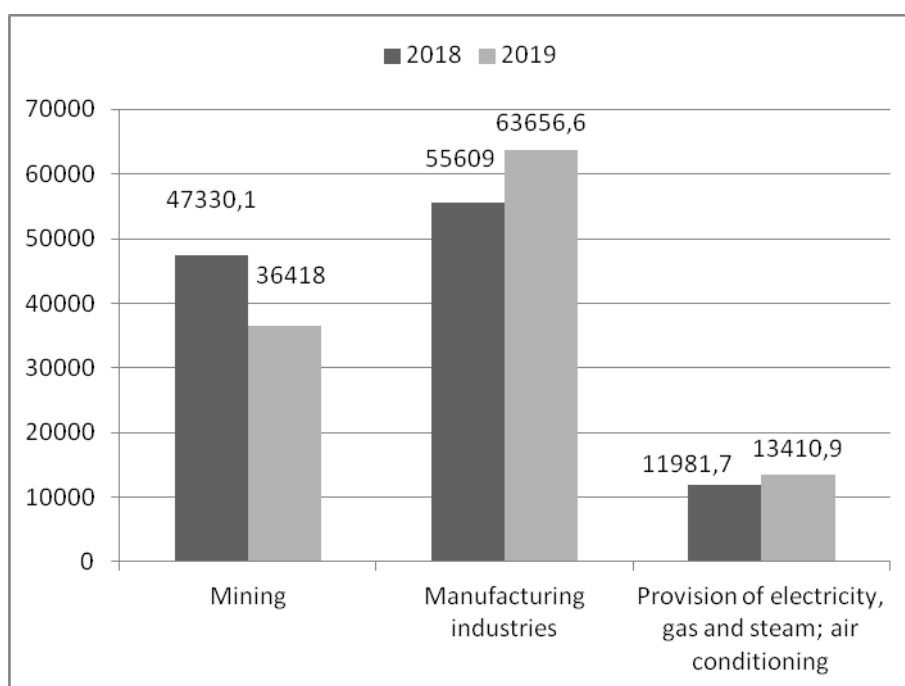
3. Results and Discussion

Strategic alternatives for the sustainable development of industrial enterprises determine future financial flows and consist in adapting to changing requirements in the external environment, which makes it necessary to take into account the current market conditions. In this case, companies' managers must take into account the system of internal capabilities (production capacity, the level of their renewal, labour productivity). At the beginning of 2021, Russian industrial sector was represented by more than 820 enterprises (table 1). Together, this sector of the economy provides 28% of Russia's GDP. The average annual number of people employed in industrial production at the beginning of 2020 was 13.6 million people, which corresponds to 18.9% of the total number of people employed in the country.

Over the past 20 years, there has been an active institutional regulation of the Russian economy greening, which is due to the transformation of stakeholders' interests. As a result, the volume of investments in fixed assets in the Russian industry, aimed at environmental protection and rational use of natural resources, is growing (figure 1).

Table 1. Dynamics of the number of industrial enterprises in Russia, thousands at the beginning of the year (compiled by the authors according to [10]).

Industrial sector	2019	2020	2021
agriculture, forestry, hunting, fishing and fish farming	115.4	102.9	95.3
mining	17.2	16.9	16.7
manufacturing industries	309.8	286.6	266
provision of electricity, gas and steam; air conditioning	22.5	21.1	20
water supply; organization of waste collection and disposal, activities to eliminate pollution	26.1	24.2	22.4
construction	474.9	439	405

**Figure 1.** Dynamics of investments in fixed assets aimed at environmental protection and rational use of natural resources at the beginning of the year, million roubles (compiled by the authors based on data from [10]).

The development of a sustainable economy is facilitated by the active work of specialized international initiatives and platforms of the UN, OECD, World Bank, etc. The introduction of the sustainable development concept in the Russian economy is supported at the institutional level. In Russia, the state is implementing targeted programs, which organize platforms for discussing the interests of all interested parties.

The results of the ecological adaptation of industrial enterprises in Russia are illustrated by the system of market signals in the field of green investments (ESG investments). In 2019, the Russian Union of Industrialists and Entrepreneurs (RSPP) developed ESG indices to assess the degree of implementation of the sustainable development concept in the activities of Russian companies: “responsibility and openness” and “vector of sustainable development” [11]. These indices became the basis for the Moscow Exchange to calculate daily stock indices (MRRT and MRSV). Since the beginning of 2012, a retrospective calculation of these indices has been made. It can be stated that a vector of responsible ESG investment is being formed on the Russian stock market, which has been updated in the context of the coronavirus pandemic.

The indicator “responsibility and openness” reflects the degree of disclosure of information on sustainable development and corporate social responsibility. The indicator “vector of sustainable development” illustrates the performance of companies in the field of sustainable development and corporate social responsibility. The indices are interconnected. Using the “responsibility and openness” index, RSPP experts compile a list of companies that demonstrate the widest volume and high quality of information disclosure.

Of the 46 leading companies that received the highest rating in 2020 according to the Responsibility and Transparency Index, 28 belong to various industrial sectors (for example, Alrosa, Eurochem, Metallinvest, Novatek, etc.). In the mission and goals of these companies, they declare an orientation towards responsible consumption of resources and the implementation of social programs. At the same time, both the very fact of disclosing information about the directions and intentions of greening the business and the levels of disclosure of certain indicators are assessed: declarative, illustrative and consolidated.

The Sustainable Development Vector Index is calculated for the leading companies in the Responsibility and Transparency Index based on real measurable management decisions aimed at sustainable development of enterprises. These are indicators of greening activities due to investments in the modernization of production facilities, growth of labour productivity, an effective system of industrial safety and labour protection, energy efficiency and energy consumption control, personnel training, and support of local communities. At the end of 2020, 38 enterprises were included in the group of leaders according to the Sustainable Development Vector Index (for comparison, in 2019 there were 30 of them). The companies represent such industries as: mechanical engineering (1 company), real estate and construction (1 company), oil and oil&gas industry (6 companies), precious metals and diamonds industry (4 companies), coal industry (1 company), chemical and petrochemical industry (4 companies), non-ferrous and ferrous metallurgy (9 companies), power industry (4 companies). There is a clear positive dynamics in terms of indicators: wages, staff training, safety, support of local communities, as well as the whole range of environmental indicators.

In the ESG Fund rating report, the telecommunications sectors have the highest weight. Precious metals, Energy, Holdings and Non-precious metals. The quite significant positions of the industrial sector are second only to the telecommunications sector and show the values of the indices higher than those of the traditionally socially oriented banking sector.

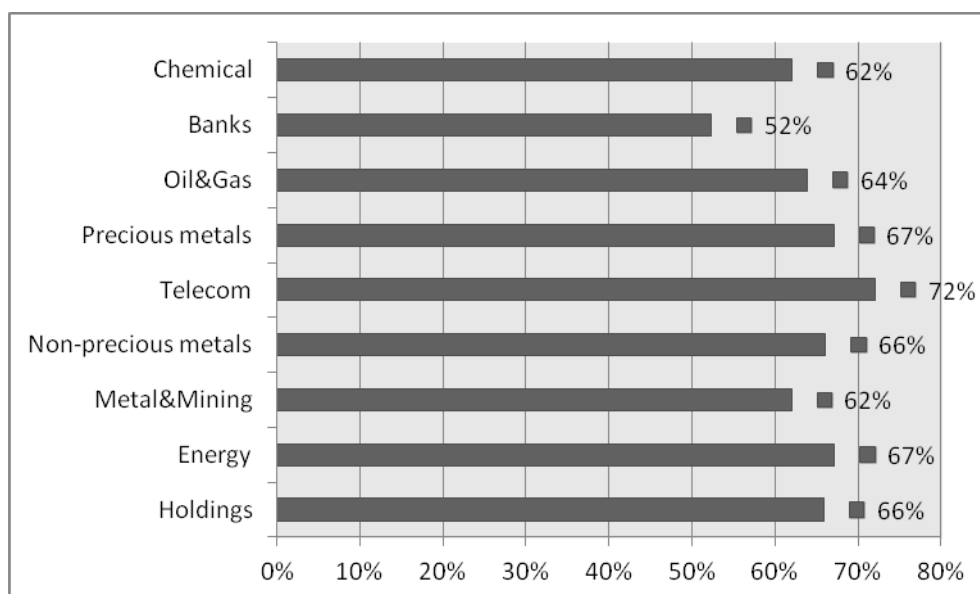


Figure 2. ESG Fund Assessment by Industrial Sector (Weighted), 2020 (compiled by the authors based on data from [12]).

The starting point for the transformation of environmental landmarks is strategic planning. There are two main approaches to the formation of the goals of strategic enterprise management [13-14]. The first of them — monistic — is characterized by the desire to highlight a common or main goal. It can be used in developing a mission or substantiating a strategic choice. The second approach is multipurpose, within which a variety of operational methods can be introduced to achieve the results facing the company's management in the field of greening and sustainable development.

The shift in the attention of investors, government and other stakeholders to sustainable companies reflects the general vector of the economic paradigm transformation in the Russian industrial sector. Industrial enterprises operate under the conditions of the need to transform strategic alternatives in order to adapt to the changed requirements for greening their activities [15-16]. Society, through market instruments, influences Russian industrial enterprises. Under existing conditions, it is not enough for companies to declare and give individual examples of greening their activities. It is necessary to improve the quality of consolidated reporting on sustainable development, to increase the analytical value of disclosed information, to develop specific areas of sustainable development and greening, with the achievement being illustrated by the dynamics of specific indicators.

4. Conclusion

Each country independently determines the most suitable way for its realities to implement the concept of sustainable economic development and achieve sustainable development goals.

The main basic factors determining the environmental adaptation of Russian enterprises are the institutional regulation in the field of energy efficiency and the extraction and use of natural resources. Such measures provide short-term and non-systematic results. However, to start the greening of business, such measures lead to an increase in the scale of implementation of a given vector of development.

The next group of factors is the development of sectoral and inter-sectoral associations as well as the development and implementation of voluntary standards for the greening of business with a view to sustainable development. The development of such associations is an alternative vector of institutional regulation, and the effectiveness of this approach in practice turns out to be higher than that of the previously mentioned one.

The third group of factors. The most effective motivation for sustainable development in modern Russian conditions is a direct request from stakeholders for greening business. This demand manifests itself both on the part of end consumers, in the form of an increase in demand for environmentally friendly goods and services, and on the part of investors who assess the prospects of their investments from the standpoint of green investment. Enterprises do not miss such signals from the market, which is confirmed by the annual growth of companies that publish public reports on sustainable development, and the improvement in the quality of these reports.

The number of Russian enterprises that effectively implement the concept of sustainable development in comparison with the total number of operating enterprises is extremely insufficient to restructure the economy for the green growth. Therefore, institutional regulation in the field of greening business, of course, should be present as a factor triggering these processes for the national market. However, the behaviour of stakeholders, especially investors, demonstrates a rethinking of the demand for indicators of economic growth, taking into account the economic, environmental and social aspects of sustainable development. Under the competition between national enterprises for the financial attention of stakeholders with enterprises of foreign developed stock markets, the development of the ESG investments concept determines the acceleration of the environmental guidelines formation to ensure sustainable development of industrial enterprises.

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