

**GREEN ECONOMY AND ESG IN RUSSIA: PROJECT EVALUATION CRITERIA,
RISK ANALYSIS AND MANAGEMENT METHODS**

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ABSTRACT

Objective: The purpose of the article is to develop an effective approach to rating Russian companies and financial instruments based on ESG factors, which makes it easier to promote the sustainable development concept in Russia and contributes to the implementation and financing of "green" projects.

Methods: The article examines the role and place of the ESG agenda at the present stage of economic and social development. Authors used methods of synthesis, analysis, classification and systematization of information.

Results: The main provisions formulated by scientists and practitioners from all over the world are summarized. The list of criteria characterizing the company, society and the state in terms of compliance with the principles of sustainable development is highlighted. The author's weights distribution model of the described characteristics is proposed in order to form parametric systems for evaluating issuers for compliance with ESG criteria. The international and Russian experience of rating "green" projects is analyzed, and options for improving Russian practice are proposed. The list of risks inherent in the "green" financial instruments issues is highlighted.

Conclusion: Particular attention is paid to the impossibility of all factors comprehensive consideration by an individual investor, in connection with which the idea is put forward about the expediency of using innovative technologies, such as neural networks, for rating issues of "green" financial instruments and issuers themselves, in order to facilitate the investor's asset selection process. General conclusions are drawn about the state and prospects of the sustainability market in the world and in Russia, recommendations are given to the investors.

Keywords: Green economy. ESG. Investments. Sustainable development. Risk management.

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ECONOMIA VERDE E ESG NA RÚSSIA: CRITÉRIOS DE AVALIAÇÃO DE PROJETOS, ANÁLISE DE RISCO E MÉTODOS DE GESTÃO

RESUMO

Objetivo: O objetivo do artigo é desenvolver uma abordagem eficaz para classificar empresas e instrumentos financeiros russos com base em fatores ESG, o que facilita a promoção do conceito de desenvolvimento sustentável na Rússia e contribui para a implementação e financiamento de projetos "verdes".

Métodos: O artigo examina o papel e o lugar da agenda ESG no atual estágio de desenvolvimento econômico e social. Os autores utilizaram métodos de síntese, análise, classificação e sistematização das informações.

Resultados: As principais disposições formuladas por cientistas e profissionais de todo o mundo são resumidas. Destaca-se a lista de critérios que caracterizam a empresa, a sociedade e o Estado quanto ao cumprimento dos princípios do desenvolvimento sustentável. O modelo de distribuição de pesos do autor das características descritas é proposto a fim de formar sistemas paramétricos para avaliação de emissores quanto à conformidade com os critérios ESG. A experiência internacional e russa de classificação de projetos "verdes" é analisada e são propostas opções para melhorar a prática russa. A lista de riscos inerentes às emissões de instrumentos financeiros "verdes" é destacada.

Conclusão: É dada especial atenção à impossibilidade de consideração abrangente de todos os fatores por um investidor individual, em conexão com a qual é apresentada a ideia sobre a conveniência de usar tecnologias inovadoras, como redes neurais, para emissões de classificação de instrumentos financeiros "verdes" e os próprios emissores, a fim de facilitar o processo de seleção de ativos do investidor. São tiradas conclusões gerais sobre o estado e as perspectivas do mercado de sustentabilidade no mundo e na Rússia, recomendações são dadas aos investidores.

Palavras-chave: Economia verde. ESG. Investimentos. Desenvolvimento sustentável. Gerenciamento de riscos.



ECONOMÍA VERDE Y ASG EN RUSIA: CRITERIOS DE EVALUACIÓN DE PROYECTOS, ANÁLISIS DE RIESGOS Y MÉTODOS DE GESTIÓN

RESUMEN

Objetivo: El propósito del artículo es desarrollar un enfoque efectivo para calificar empresas e instrumentos financieros rusos en función de factores ESG, lo que facilita la promoción del concepto de desarrollo sostenible en Rusia y contribuye a la implementación y financiación de proyectos "verdes".

Métodos: El artículo examina el papel y el lugar de la agenda ESG en la etapa actual de desarrollo económico y social. Los autores utilizaron métodos de síntesis, análisis, clasificación y sistematización de la información.

Resultados: Se resumen las principales disposiciones formuladas por científicos y profesionales de todo el mundo. Se destaca la lista de criterios que caracterizan a la empresa, la sociedad y el estado en cuanto al cumplimiento de los principios del desarrollo sostenible. Se propone el modelo de distribución de pesos del autor de las características descritas con el fin de formar sistemas paramétricos para evaluar a los emisores en el cumplimiento de los criterios ESG. Se analiza la experiencia internacional y rusa de calificar proyectos "verdes" y se proponen opciones para mejorar la práctica rusa. Se destaca la lista de riesgos inherentes a las emisiones de instrumentos financieros "verdes".

Conclusión: Se presta especial atención a la imposibilidad de que un inversor individual tenga en cuenta todos los factores, en relación con lo cual se plantea la idea de la conveniencia de utilizar tecnologías innovadoras, como las redes neuronales, para calificar emisiones de instrumentos financieros "verdes". y los propios emisores, con el fin de facilitar el proceso de selección de activos del inversor. Se extraen conclusiones generales sobre el estado y las perspectivas del mercado de la sostenibilidad en el mundo y en Rusia, se dan recomendaciones a los inversores.

Palabras clave: Economía verde. ASG. Inversiones. Desarrollo sostenible. Gestión de riesgos.

1. INTRODUCTION

Human society is continuously developing. Progress is a key goal of the scientists and practitioners, representatives of both authorities and entrepreneurship. Traditionally, progress is understood as a kind of benefit, something that makes the production process faster and less costly, shortens the path from the manufacturer to the consumer, allows the consumer to get more utility from consumption, or to satisfy a wider range of needs at lower cost, or to offer a fundamentally new service, which has no analogues on the market so far. Of course, these goals are good, however, the economic interest of the capital owners throughout history makes certain



adjustments, and, as a result, progress often has more or less lasting negative consequences for society. For example, industrialization was accompanied by mass unemployment, and the first attempts to put into practice the theory of relative advantages led to the exploitation of labor and the plundering of the developing countries resources. The idea that the economy and society should develop harmoniously is not new, but at the present stage its flagship embodiment has become the concept of sustainable development, which assumes disregard for the short-term business benefits in favor of achieving greater long-term benefits in the form of the social equality, the protected environment, the safe legal society and, ultimately, the economic benefits of all subjects, not individual units.

Thus, it can be said that the purpose of the concept is to create a sustainable long-term model of the economy and society organization, which will ensure the population well-being and will protect the environment (Pankova, 2020).

With the development and dissemination of the sustainable development concept, the number of projects aimed at achieving such goals increases. Their financing is carried out largely on the basis of a special type of financial instrument – sustainability bonds.

The initial formation of these financial instruments market took place in 2007. After that, it began to attract more and more attention from investors (Niyazbekova et al., 2021). It can be noted that at the global level there is an increasing trend in the issuance volume of sustainability financial instruments (Frydrych, 2021). The growing interest in sustainable and "green" investment has helped to spread this concept to developing countries (Banga, 2019).

Issues of sustainability securities are an important component of the concept promotion, as they allow the implementation of "green" and socially oriented projects (Zimmerman et al., 2019). Thus, the increase in the volumes of issues indicates the promotion of the concept.

An increase in the number of companies involved in "green" projects can also be noted. Many companies use such projects as instruments for attracting new investors and improving their image and reputation (Semenova, Semenov, 2022).

The practice of ESG investing is also spreading. In this type of investment, ESG factors are a crucial element in the process of selecting issuers. Together with the growth of ESG investments, the importance of ESG disclosure quality is also increasing (Wen et al., 2022).

In Russian practice, ESG investing is only in the phase of its formation. Nevertheless, this direction continues to gain popularity, methods and standards for assessing ESG factors on a local market are being created (Finogenova et al., 2022).



Nevertheless, ESG together with the concept of sustainable development are gradually beginning to play an increasingly important role in Russia. Thus, partial implementation of sustainable development mechanisms has occurred in a number of central and north-western regions (Shkiperova et al., 2019).

One of the first questions that a researcher faces when analyzing ESG is a list of criteria that should be paid attention to first of all when building a model for the development of the economy and society according to a "green" and socially responsible scheme. It is worth noting that there is no single established system here – in the world, when evaluating the policies pursued by companies and rating their securities and issues, each rating agency uses its own, somewhat unique, system of criteria built on the basis of a point-rating model, where a number of parameters are determined in advance, each of which has its assigned weight (ACRA – Rating agency, 2023; Infragreen – Expert-analytical platform, 2023; S&P Global – Rating agency, 2023; Sustainalytics – Sustainability rating company, 2023).

An important component of the global practice of using ESG factors is the creation of special frameworks. They help investors to acquire reliable sustainability and ESG related information about the companies (Cruz, Matos, 2023).

Another important element of ESG development in the world practice is targeted approach. It is based on setting specific sustainable development goals (Biermann, Kanie, Kim, 2017). Partially this approach was used in the projects of the emissions reduction in the UK (Shahbaz et al., 2020).

In Russian practice, ESG-based rating models are under development, and in most cases the weighting coefficients are distributed equally among all the categories under consideration, which, of course, can (and should) be improved. The proposal for such an improvement is one of the goals of this study.

Another equally important goal is to consider the risks associated with the transition to a "green" and socially-oriented model of economic development, their classification, systematization and consideration of effective management methods, both by traditional methods and through the introduction of innovative digital technologies.

2. METHODS

The study analyzed the global and Russian practice of analyzing companies and securities for compliance with ESG criteria. The main components of the ESG, their features and



accounting procedures were considered. It was evaluated which of the criteria are considered the most important according to rating agencies.

The ESG indicators organization systems used to assign ratings based on these factors were also analyzed. Taking into account international and Russian practice, a special system has been developed that makes it possible to evaluate Russian companies according to these criteria.

Special attention was paid to the risks solved by the implementation of the ESG indicators system, as well as the risks arising from the issuance of sustainability financial instruments.

Methods of synthesis and analysis were used in the course of the study. Classification and systematization of information, induction, comparison were also used. Tabular and graphical methods were used.

To analyze the Russian and world practice of using ESG criteria, data from Russian and international rating agencies were used.

3. RESULTS

It is worth starting with the decomposition of the general concept into its three components: environmental issues/environmental protection (E – Environmental), issues of social justice and responsibility (S – Social) and issues of management quality (both at the level of companies and at the level of national governments), and the economic efficiency of management and production activities (G – Corporate Governance).

Indeed, without a responsible attitude to nature, a healthy life of a person and society is practically impossible. We should not forget about the exhaustion of the majority of natural resources consumed by mankind daily in colossal volumes in order to meet their needs. Society cannot develop harmoniously in conditions of unfair resources distribution, restrictions on access to benefits for certain categories of persons, racial, gender or any other discrediting. Such manifestations will certainly lead to social upheavals, which will have the most negative impact on both social and economic life. We should not forget about the role of managers in the development and existence of society, the country and the company. A clear formulation of achievable and necessary development goals, comprehensive control over the methods to achieve them, deadlines for completing tasks, encouraging timely fulfillment and over-fulfillment, and penalties for disrupting the plan or using unacceptable methods, is absolutely necessary.



Despite the fact that all these parts are closely interrelated with each other, the criteria should be considered within each, since the internal structure of all three is fundamentally different. Summarizing the results of research by scientists around the world will help to identify the appropriate criteria within each part.

The first group of criteria: environmental issues /environmental protection (E):

E. 1. Emissions of CO₂ and other harmful gases are an indicator illustrating the degree of negative impact of production on the planet's atmosphere and the health of the population, through the impact on the air quality that this population breathes. There is no need to justify the importance of this indicator – with the forests and jungles area reduction all over the planet, as well as with the increase in the average ocean water temperature, less and less terrestrial and underwater flora purifies the air of our planet. At the same time, the increasing production volumes of absolutely all goods, caused at least by the growth of the Earth's population, are capable of completely destroying the planet's ecosystem in the shortest possible time. Therefore it is necessary to pay maximum attention to the problem of emissions reduction.

E.2. Wastewater – the meaning and significance of this criterion is almost completely coincide with the previous one, with the only difference that we are talking about the world ocean waters pollution, and not directly the Earth's atmosphere. The significance of this point is that wastewater poisons the habitat of marine and river organisms (flora and fauna), affecting not only biodiversity, but also the health of mankind, who consumes both drinking water and use many of these representatives as food.

E.3. Other waste – the topic of fertile soils pollution ends the "trinity" of earth, water and air as a human habitat.

E.4. The extraction, the consumption and the use of non-renewable natural resources (efficiency/possible harm) – humanity is still very far from the stage of development at which ensuring the satisfaction of all (constantly growing) needs will be possible through the use of exclusively renewable resources. Therefore the problem of the available resources exhaustion prevention is more acute today than ever, and all economic entities should think about future opportunities and needs to provide these opportunities with resources, almost more than about the current needs.

E.5. The usage of renewable energy sources – this point logically follows the previous one, because from the very concept of "non-renewable resources" it follows that, no matter how long their consumption takes, sooner or later their reserves will come to an end. The only way



to prevent a total regression of society is to switch to sources of relatively infinite energy (for example, solar).

E.6. Preservation of biodiversity – it is a criterion that recalls the humanity responsibility for our own habitat. Many species are endemic and are not able to survive in the conditions that man creates by changing their natural habitat, which leads to species extinction, disruption of food chains, and an imbalance in the entire natural system.

The second group of criteria – issues of social justice and responsibility (S) – was divided into two subgroups. The first of them (subgroup A) includes criteria for companies, the second (subgroup B) – for countries and municipalities.

S.A.1. The salary level – it shows, on the one hand, how fairly the work of each employee is paid, on the other hand, how fairly income is distributed between different positions types. Ideally, the salary level should not only allow the employee to maintain the quality of his life at a high level, but also exclude extreme situations in which positions within the same company differ in remuneration by orders of magnitude.

S.A.2. Traumatism – this criterion characterizes both the degree of production danger and the company responsibility level in relation to the health, life and safety of its employees.

S.A.3. Labour safety – it reflects the general development of norms and rules that govern the professional activity processes at the enterprise.

S.A.4. HR policy – it is an indicator that characterizes the priorities that the company will determine for itself when hiring employees. The company can immediately look for a narrow-profile specialist with many years of experience in the specialty, or it can have professional training and retraining programs, giving young professionals the opportunity to realize themselves in the chosen industry. There may or may not be loyalty programs for certain social and/or ethnic groups of individuals.

S.A.5. Gender equality – it is a criterion that characterizes not only the wages distribution between specialists of different sexes, but also positions, tasks performed, and the like.

S.A.6. Staff turnover – this criterion should be viewed from different angles. At first glance, stability is one of the qualities that a successful company should strive for. However, if the personnel composition changes due to the prevention of certain negative actions of a professional or personal nature within the team, then such rearrangements are more a blessing than a problem.

S.A.7. Insurance/pensions/corporate programs – this criterion shows how much influence the company pays to the issues of ensuring the future of its employees both during work and



after its termination by natural (age) or form majeure (an accident at work / during non-working hours) circumstances.

S.A.8. Compliance with social norms – it is a complex concept that includes both interaction between people within the company and the interaction of the company itself, through its representatives, with society. Internal relations include interpersonal relationships of "horizontal" and "vertical" types – the employees interaction at the level of one position, as well as with higher and lower positions. External contacts include any company's contacts with society: from advertising its products/services to customer service. For example, advertising, being a powerful tool for influencing the psyche, including the immature (children's), should not contain messages that are unacceptable or condemned by society, and even cause negative associations.

S.A.9. The quality of services/products – it is a natural criterion that obliges the company to carry out its activities in good faith, providing the consumer with the promised usefulness in full, or compensating for losses incurred through warranty service, replacement or refund. It is also necessary to pay attention to the quality standards and quality control systems that the company implements and uses, encouraging a responsible approach.

S.A.10. Responsibility towards society – it implies the introduction and sponsorship of all kinds of useful programs and projects for the population in the regions where a large corporation operates. These are professional training and retraining programs, organization of scientific and practical conferences, educational projects and internships for children and youth, etc.

S.B.1. The main and most generalized criterion is the standard of the population living in a particular country or region. There are various methods of calculating this indicator, and its various derivatives, such as, for example, the happiness index.

S.B.2. The size of the average (or median) salary and state pensions. The standard of living, through the level of affluence, of civil servants and the institutional population directly depends on the amount of government spending on paying and awarding their labor. However, the prosperity of residents working in commercial structures also indirectly depends on the state, because it is it, through the tax system, the system of benefits and restrictions, the creation of special economic zones, etc., that creates the country investment attractiveness for the business. Country risk – an indicator that directly affects the business activity placing its production facilities and representative offices on the territory of a particular country – is also the result of the policy pursued by the authorities. And taking care of the social security of



people who, for one reason or another, have completed their professional activities is one of the inalienable and key duties of the state.

S.B.3. A reliable healthcare system – it is an element without which positive indicators such as life expectancy, fertility, quality of life, etc. are impossible.

S.B.4. Education – it is a base for training future professionals in all spheres of life, as well as an element of expanding a person's horizons, it is a necessary step towards a stable and prosperous society.

S.B.5. High or low crime rate – it is an indicator that directly follows from the programs implemented by the state to support socially unprotected segments of the population.

S.B.6. Unemployment – it is the result of the state's economic and social policy.

S.B.7. Traditionally, various demographic indicators are also considered, such as fertility and mortality rates, internal and external migration, etc. They characterize both the economic and social situation in the state.

The third group of criteria – the issues of governance quality and economic efficiency of both management and production activities (G) – is divided into the same two subgroups.

G.A.1. Equity/shares distribution – external and internal. The "openness" of a business is characterized not only by the type of company but also by whether shareholders have a real influence on decision-making. There may be situations when, despite the large amount of shares in public circulation, their holders are a wide range of minority shareholders who have included the company's securities in the portfolio in order to receive dividends or in the hope of an increase in their price, do not participate in management in any way, and the full power is in the hands of one person, or a small group of persons with similar interests controlling a certain amount of shares with a strategic goal. In this situation, openness will be imaginary.

G.A.2. The board of directors independence/stability/constancy – it is the criterion without which it is impossible to implement consistent long-term measures, especially socially significant ones, such as reorientation to sustainable development goals.

G.A.3. The information disclosure/completeness – it is also a necessary basis for attracting investors and creating an atmosphere of trust between the company's management and its shareholders.

G.A.4. The boards experience is also necessary for the successful implementation of complex projects involving possible financial and non-financial risks.

G.A.5. The strategy and business model determine both possible ways to integrate the ideas of sustainable development, and the very possibility of applying this concept.



G.A.6. Risk management – it is the cornerstone of the production and management process, as it requires a comprehensive risk analysis (from the banal failure to achieve financial results planned in the short term to global problems, such as loss of competitiveness in the market) at all stages, as well as timely competent and complete control over the possible negative consequences.

G.A.7. Efficiency is a whole set of indicators that characterize the company's activities. No matter how socially oriented the projects implemented by the business are, without a certain financial return they cannot survive in the conditions of the fiercest competition. In this regard, investors analyze a wide range of return indicators (assets, equity, sales, etc.), as well as the effectiveness of certain types of costs, such as the return on marketing, the cost of maintaining senior management, etc.

G.A.8. The management system, as a logical continuation of the previous paragraph, is analyzed in order, for example, to determine how effectively the vertical of power is built in the company, whether the employees interaction chain in different positions is rationally organized among themselves. When extremely or artificially complicated interaction models are detected, a decision is made to optimize them, or an alternative option is preferred. The reverse situation is also possible with the detection of "missing links", when too many responsibilities are assigned to one position. This situation is the result of "thoughtless optimization" or errors during such, and it should also be corrected.

G.B.1. Corruption level – this criterion represents the percentage of government spending that is spent not for the purposes specified in the project, but "settles" in the pockets of corrupt officials and businessmen, directly indicates the prospects (or lack thereof) of carrying out activities related to the financing of certain social projects from the state budget.

G.B.2. The national development strategy – it is the course that the state has determined for itself for the coming years. It includes main goals and the budget expenditures structure. The list of goals and obligations assumed by the government and the budget shows how the level and quality of life in the country can change, in which direction the country risks will change and how all of this will affect the national investment attractiveness.

G.B.3. The management efficiency at the state level differs from the corporate level only in the scale and nature of the tasks performed.

G.B.4. The developed infrastructure significantly simplifies and accelerates the population's access to social benefits, which were provided by government spending. An undeveloped infrastructure, in turn, reduces the effectiveness of such costs, since it is not able



to provide the population with access to new opportunities in a timely and complete manner, or simply inform about them.

G.B.5. The economy stability – it is a general criterion that shows how well the state's economy is prepared and resistant to shocks and crisis phenomena. When considering it, attention is drawn to the size of the state debt, its structure, ratings of state and municipal bonds, the sovereign rating of the state, etc.

It is worth noting that the classification described above is not unique or the only possible one.

In the current conditions, the number of variations in the ESG assessment and application methods is significantly increasing, which generates a lot of disputes and disagreements (Liu, 2022). The classification given here tries to generalize the existing Russian and world experience of using ESG.

It should be understood that in order to promote the concept of sustainable development and the ESG agenda in Russia, it is necessary to systematize these criteria, which would allow creating the ESG and sustainability based framework (Yakovlev, Kabir, Rakov, 2017).

It is also worth noting that the growth of sustainability investment has led to a certain blurring of its concept. This leads to the necessity of creating a system that will be able to identify projects and companies that are truly focused on ESG and sustainability (Migliorelli, 2021).

Let's consider the organization of the criteria system, including weighting coefficients (Table 1).

Table 1. Criteria organization system

E		S				G			
		A		B		A		B	
Criteria	Weight	Criteria	Weight	Criteria	Weight	Criteria	Weight	Criteria	Weight
E.1	0,1	S.A.1	0,04	S.B.1	0,06	G.A.1	0,03	G.B.1	0,09
E.2	0,06	S.A.2	0,04	S.B.2	0,04	G.A.2	0,05	G.B.2	0,09
E.3	0,06	S.A.3	0,04	S.B.3	0,04	G.A.3	0,05	G.B.3	0,04
E.4	0,06	S.A.4	0,02	S.B.4	0,04	G.A.4	0,03	G.B.4	0,04
E.5	0,06	S.A.5	0,02	S.B.5	0,04	G.A.5	0,03	G.B.5	0,04
E.6	0,06	S.A.6	0,02	S.B.6	0,04	G.A.6	0,05	-	-
-	-	S.A.7	0,02	S.B.7	0,04	G.A.7	0,03	-	-
-	-	S.A.8	0,04	-	-	G.A.8	0,03	-	-
-	-	S.A.9	0,02	-	-	-	-	-	-
-	-	S.A.10	0,04	-	-	-	-	-	-
	0,4		0,3		0,3		0,3		0,3
0,4		0,3				0,3			

It is worth noting that this table was formed taking into account both Russian and world practice of using ESG models. For this reason, it is advisable to consider what factors are usually highlighted by rating agencies in world practice.

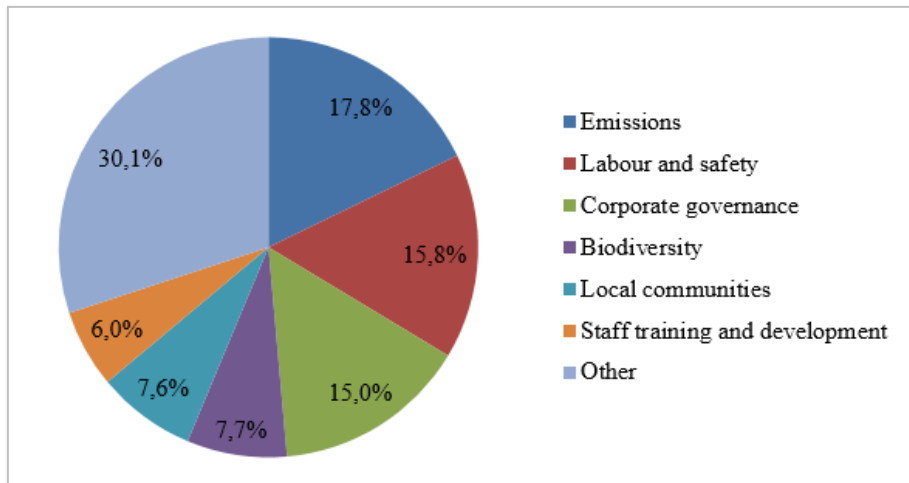


Figure 1. Metals and Mining

As can be seen in Figure 1, there is no single criterion that draws all the attention of rating agencies. The "Other" section consists of many indicators that individually have extremely low weight, but, in aggregate, they occupy almost a third of the analyzed information volume. In the second place in the Metals and Mining sector, emissions are expected, in the third – labour and compliance with safety standards. Then there are corporate governance issues, biodiversity preservation, interaction with local communities and programs aimed at training and development of employees.

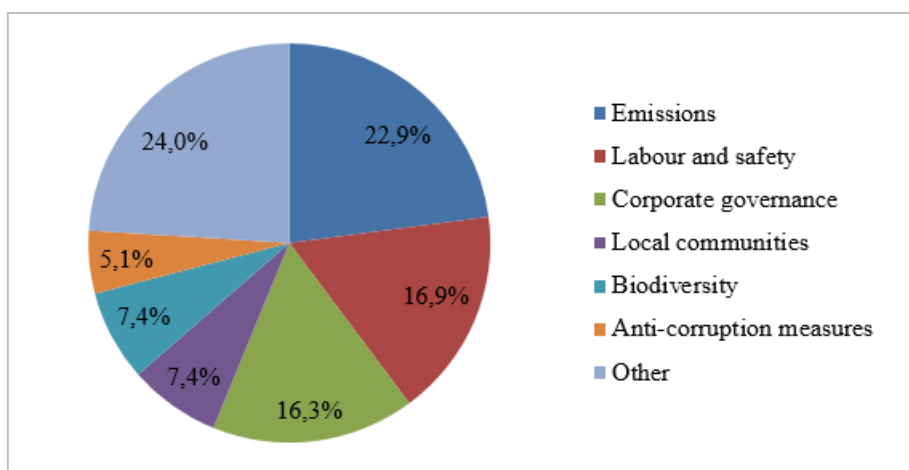


Figure 2. Oil and Gas

A similar situation is observed in the O&G sector, as can be seen in Figure 2. Here in the first place is also a set of criteria summarized by the section "Other", although its weight is

lower than in the previous case. This is also followed by emissions, safety and corporate governance issues. Local communities and biodiversity are recognized as equally important agendas for this industry. In general, we can say that there is no fundamental difference between these two sectors.

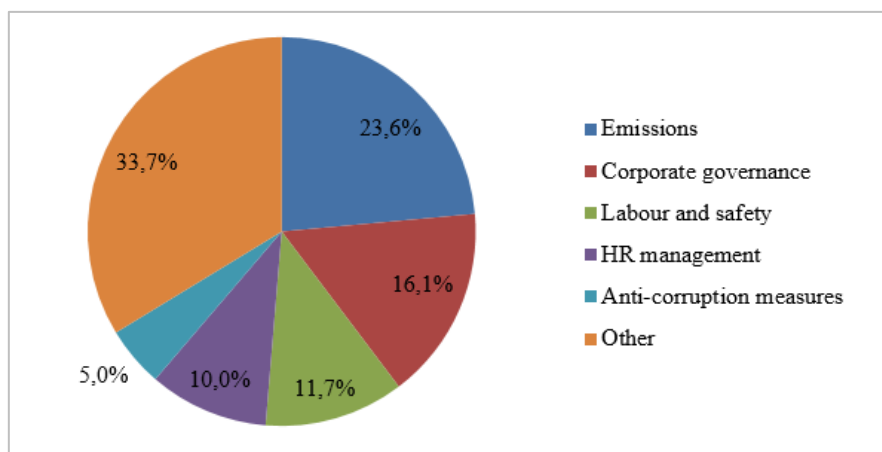


Figure 3. Energy Utilities

There are no surprises in the "Energy Utilities", as evidenced by Figure 3. The first four places remain unchanged, then the issues of HR management and countering corruption are located.

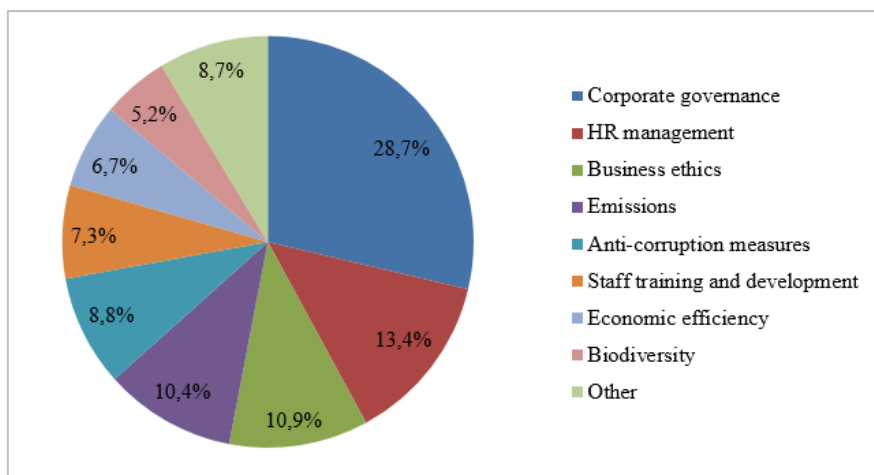


Figure 4. Finance

However, in the Finance sector, there is an indisputable leader criterion –corporate governance. It is followed by HR management and business ethics.

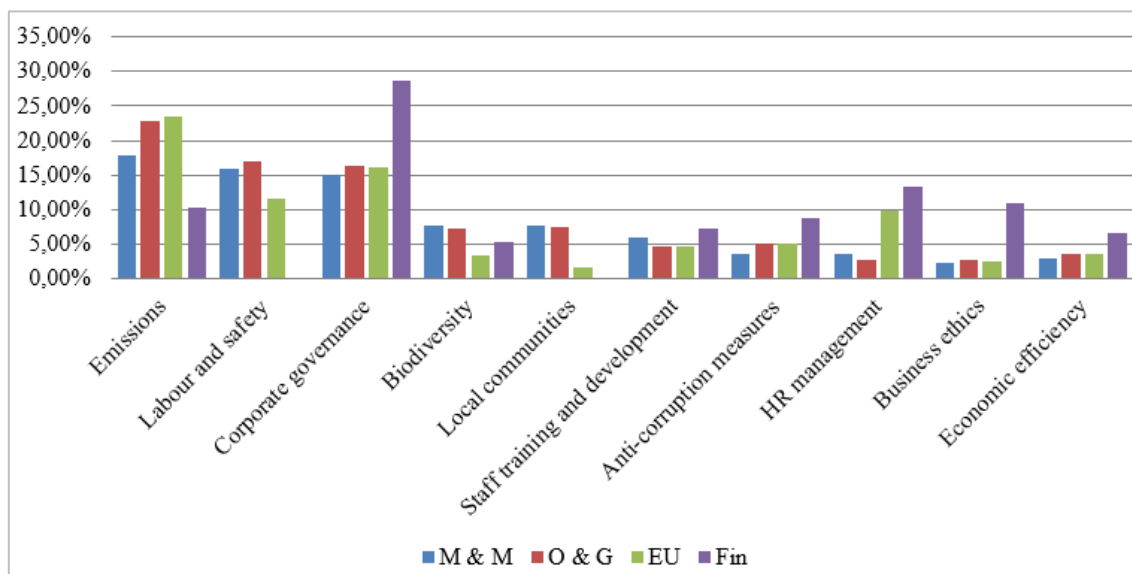


Figure 5. Intersectoral comparison

Overall, it is obvious that it is environmental issues that are given priority attention, as the topic of emissions has taken the undisputed first place. Also in the focus of attention from this category was the biodiversity. The leading rating agencies also assign one of the key roles to labour safety and corporate governance (Climate Bonds Initiative, 2023; Moscow Stock Exchange, 2023).

The implementation of projects related to the "green" and socially responsible agenda is inseparable from the risks associated with it. ESG risks are non-financial risks associated with the sustainable development concept. These risks are also logically divided into three groups based on the main elements of this concept. Such groups are:

- environmental risks;
- social risks;
- governance risks.

The first group includes the risks of causing harm to the environment by actions or inaction on the part of the corporation. The main sources of these risks are:

- the damage to the environment through the release of toxic gases (1), sewage (2) or soil contamination with chemicals (3);
- the inefficient and/or excessive use of natural resources;
- the harm caused to biodiversity.

These risks leads to the violation of natural conditions, alterations of weather and climatic conditions by anthropogenic factors.



The group of social risks includes risks associated with violation of labour relations, or causing physical or material harm. The main sources of such risks are:

- the violation of safety regulations;
- the poor quality of service or products;
- the property or health damage caused by the actions of the company;
- the violation of labour regulations;
- the lack of corporate responsibility standards, leading to a decrease in image and business reputation.

Governance risks are risks associated with the inefficiency of the company's strategy and/or its management (at the company level) and the state – at the level of national governments and local self–government bodies of municipalities. The sources of such risks may be:

- the low efficiency of the company/state/municipal development strategy;
- the inefficient structure/organization of the company/state/municipality;
- the frequent change of governance structure (board of directors/authorities);
- the problems related to the structure of capital ownership (for companies);
- the corruption.

Since priority attention is paid specifically to environmental risks, let's focus in more detail on what risks the issuer and the investor face when issuing "green" financial instruments.

1. The lack of demand – traditional instruments may be more obvious to investors, or promise greater returns, especially in the short term.

2. The problems of the certification system underdevelopment and the non-corresponding approaches to assessing the weights of the criteria underlying these systems.

3. The risks of the funds misuse – are a major threat to both potential income and benefits for investors, as well as to the image of the entire ESG agenda as a whole.

4. The inability to implement the project due to force majeure of any nature - the risk of a sudden extreme risks aggravation from the category of catastrophic, albeit to a small extent, is always present.

5. The incorrect assessment of positive consequences, the failure to achieve planned parameters, the implementation of hidden and unaccounted-for risks, the negative effects instead of positive ones. Depending on the degree of criticality of the error, which may be laid down at the initial stage of the project due to some factors, the consequences that the project implementation will lead to may be diametrically opposite to what is expected. An example is



the non-biodegradability and chemical hazard of most batteries, the transition to the use of which, in theory, was supposed to help reduce the load on the biosphere.

Of course, only some of the existing risks are listed above. There are also technological and man-made risks associated with the integration of new technologies (neural networks, blockchain, cryptocurrency) – from system failures, hacker attacks and outages, to the banal human factor (for example, loss of access to a crypto wallet).

Nevertheless, it is with the development of neural networks that most scientists and practitioners associate the future of ESG transformation. Indeed, factors and risks in the implementation of such projects need to be taken into account much more than with traditional issues or investments. It would not be an exaggeration to say that the average investor cannot independently collect all the necessary information about the issuer, the project, its strengths and weaknesses, opportunities and risks, explicit, hidden, direct, indirect and deferred effects on the company, economy and society. Let's add here the need to take into account the socio-economic context of the country in which the company issues, the "pitfalls" of internal corporate governance, the issuer's interaction with society – the task seems incredible. Here a neural network can come to the investor's aid. Having the ability to self-study and having a basic set of rules, criteria, risks, opportunities and interrelations of all this among themselves, the neural network is able to analyze the risks of the project both from the point of view of the issuer and the investor, the state or society. With the help of pre-determined weights of factors, the relations of which can be either a "template given" or set by the investor individually for their needs, the neural network can rank all issuers and their projects available in a particular region, assigning each to a category. Based on these categories, the investor will only have to decide whether to include the "green" instruments of this issuer in his portfolio or choose an alternative. For the issuer, such a system will simplify the search for weaknesses and vulnerabilities of the project, will allow to "work on mistakes" in case of a negative result, and, ultimately, increase the competitiveness of its issues.

4. DISCUSSION AND CONCLUSION

The ESG agenda is one of the most relevant topics of the economy and society development at the present stage. This concept is very extensive and covers both issues of ecology and environmental preservation (the so-called "green" economy), as well as topics of social justice, equality, effective governance and many others.



Many foreign theorists have dealt with the issues of the main criteria and approaches within the ESG agenda. Russian scientists have also asked similar questions, despite the fact that the implementation of the sustainable development concept in Russia is still at an early stage. A part of this study is also devoted to highlighting the main criteria that should be paid attention to when analyzing a project, an issuer, or even an entire country or municipality.

The implementation of the sustainable development principles involves multiple risks. To work effectively with them, they should also be first identified, divided into categories and evaluated. There also is a necessity to create a special risk management system. It is worth considering that many risks of ESG projects are unique, and some are so complex that it is not possible to analyze them using standard methods.

One of the proposals aimed at simplifying the implementation of ESG projects in society, including the Russian one, may be the use of neural networks in two directions: in the selection of issuers (as assistance to an investor) and in risk analysis (as assistance to an issuer). In the first case, based on parametric weight models (an example of which is proposed in this study), the neural network will assign a point rating to the issuer based on predefined weights of a number of parameters that affect the "quality" of the issuer's securities. In the second case, the risks associated with the project will be assigned a category of significance, based on which the risk management system will be built.

In conclusion, it is worth noting that the sustainable development concept has a long way to go to become part of the Russian reality. However, with a competent approach, sufficient funding for research and the innovative technologies involvement, there can be great prospects for this direction.

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