

# ESG transformation of enterprises as an innovative trend in the context of digitalization and the new normal

## La transformación ESG de las empresas como tendencia innovadora en el contexto de la digitalización y la nueva normalidad

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### Abstract

The article explores the trends in the development of the economy in the new normal, which are associated with global digitalization and adherence to the principles of sustainable development. It has been established that the most significant trends are the ESG transformation of enterprises and the digitalization of core business processes. An analysis of digital technologies used in various fields of activity was carried out in order to comply with ESG principles in the new normal. Russian enterprises' experience and relationship with those trends are also discussed.

**key words:** global digitalization, sustainable development, digital technologies, ESG, innovation, new normal

### Resumen

El artículo explora las tendencias en el desarrollo de la economía en la nueva normalidad, que están asociadas a la digitalización global y la adhesión a los principios del desarrollo sostenible. Se ha establecido que las tendencias más significativas son la transformación ESG de las empresas y la digitalización de los procesos comerciales centrales. Se realizó un análisis de las tecnologías digitales utilizadas en diversos campos de actividad para cumplir con los principios ESG en la nueva normalidad. La experiencia y la relación de las empresas rusas con esas tendencias son también discutidas.

**Palabras clave:** digitalización global, desarrollo sostenible, tecnologías digitales, ESG, innovación, nueva normalidad

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## 1. Introduction

Currently, the key trends in the development of the economy in the new normal are associated with global digitalization and adherence to the principles of sustainable development. The COVID-19 pandemic has taken a toll on many businesses in various sectors of the economy, especially in the service and travel industries.

Digitalization acts as a driver of innovative development in all areas of socio-economic activity. The speed of introducing digital innovations into the business processes of enterprises directly affects the level of their

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competitiveness and investment attractiveness. Digitalization makes it possible to modify most of the business models of enterprises and creates innovative opportunities for business development in the new normal (Digital transformation..., 2021). It should be emphasized that the introduction of digital innovative technologies significantly affects the value of companies.

The concept of ESG (Environment, Social, Governance) is directly related to the theory of sustainable development and implies a responsible attitude to the environment (Environment), compliance with social responsibility (Social), high quality corporate governance (Governance).

The main ESG factors include:

1) E-factors:

- climate change associated with the production and economic activities of enterprises,
- greenhouse gas emissions,
- growth of industrial waste,
- depletion of natural resources,
- reduction of natural reserves of drinking water,
- uncontrolled decrease in the area of forests,

2) S-factors:

- relations with employees and improvement of their working conditions,
- lack of discrimination and gender composition of the personnel of the enterprise,
- health protection of employees of the enterprise, labor and industrial safety,
- training and development of staff, increasing their involvement,
- the relationship of the enterprise with consumers and local communities,
- diversity and inclusiveness,
- relationships with suppliers (supply chains),

3) G-factors:

- enterprise management structure,
- long-term strategy of the enterprise,
- audit and internal control,
- management remuneration,
- business integrity,
- lobbying and corruption,
- transparency,
- rights of shareholders and relations with them.

Compliance with the ESG principles in the activities of enterprises means:

- maximization of concern for the environment, including by reducing the harmful impact of the enterprise on the environment (E-principle),
- high social responsibility, including improving the working conditions of the company's personnel, investing in social projects, responsible attitude towards partners, consumers, suppliers and other market participants (S-principle),
- improving the quality of corporate governance, including public reporting of the enterprise, improving corporate culture, taking anti-corruption measures, etc. (G-principle).

ESG principles should cover all activities of enterprises, including technological processes, personnel management, etc. It should be emphasized that for industrial enterprises with a large amount of harmful emissions and waste that pollute the environment, the most attention should be paid to a responsible attitude towards the environment. Environmental responsibility is also directly relevant for service and travel businesses that bring their consumers into direct contact with the environment (Morozov & Morozova, 2018; Morozov et al., 2018). For city-forming enterprises, which are the core of the regional economy, the S-principle of participation in the creation of local infrastructure, which directly affects the quality of life, will be of the greatest importance. The role of personnel and its competencies in solving the issues of ESG-transformation of service enterprises and increasing its competitiveness is great.

For many countries, compliance with the ESG principles is the main condition for the innovative and sustainable development of the national economy, which has determined the relevance of studying the ESG transformation of Russian enterprises.

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## 2. Methodology

The research methodology is based on a systematic approach, a dialectical method of studying economic systems in the field of sustainable development, analysis of data on the activities of Russian enterprises and their compliance with the principles of ESG. The problems of sustainable development of the economy and the principles of ESG have been studied in articles (Altonar et al., 2022; Chernenko & Lyadova, 2021; Petrenko, 2020 and others). The use of digital technologies in the business processes of enterprises and their impact on personnel are considered in the works (Frey & Osborne, 2017; Horvat et al., 2019; Dozortsev, 2021 and others). The issues of responsible investment in the light of ESG principles have been studied in the works (Kachurina, 2021; Petrenko, 2020; Pilyugina & Lasunova, 2020; Terentiev, 2021 and others).

In order to identify approaches to assessing the ESG transformation of enterprises, an analysis was made of the main ESG factors taken into account when calculating the ESG rating, the rating of Russian enterprises according to RAEX-Europe was analyzed, and examples of sustainable development strategies implemented by large Russian companies were considered. One of the most effective technological solutions for achieving ESG principles is the digitalization of the main business processes of enterprises. To analyze digital innovative solutions, various digital technologies were considered, including the Internet of things, robotization, artificial intelligence, big data, virtual reality, machine learning and others, which made it possible to identify the main possibilities of their application in solving the problems of ESG transformation of enterprises of various industries.

### 3. Results

Environmental, social and management programs of ESG-transformation of enterprises affect their long-term value, and the presence of such programs is an indicator of quality management. Adherence to the principles of ESG influences the financial stability and business reputation of an enterprise and how it is perceived by other market participants, including financial institutions. Compliance with these principles provides access to responsible investments, which are becoming increasingly popular in the financial environment. Integrating ESG's environmental, social and governance factors into strategic investment decisions can bring shareholders higher and more sustainable returns in the future.

An analysis of the activities of Russian enterprises showed that in 2021, 29% of Russian enterprises used ESG indicators when assessing performance. Compliance with the ESG principles affects the ability to attract bank loans and so-called green investments (Petrenko, 2020). Currently, more than 30% of Russian banks use ESG criteria when making decisions on issuing loans.

To assess the level of implementation of ESG principles in world practice, special ESG ratings are used, which are calculated by independent research agencies Bloomberg, S&P, Dow Jones Indices, JUST Capital, MSCI, Refinitiv, etc. Ratings are calculated mainly for large companies in developed countries. The existence of a large number of different ESG ratings leads to conflicting results when evaluating ESG projects, which complicates decision-making for both institutional investors, banks and enterprises themselves. In this regard, the primary task is to develop common international standards for assessment and rating, which will ensure the clarity and unambiguity of ESG assessments.

A number of ESG indices are also calculated in Russia. In particular, the Russian Union of Industrialists and Entrepreneurs (RSPP) calculates the following indices of sustainable development of enterprises:

- "Responsibility and openness" index, which evaluates the quality of public reporting,
- index "Vector of sustainable development", reflecting the dynamics of the main socio-economic and environmental indicators.

In Russian practice, a number of other indices are used:

- the ERAX stock index, which characterizes the impact of the environmental component on the value of enterprises in the stock market,
- rating "Social efficiency of the largest Russian companies", showing the social efficiency of enterprises for the 300 largest industrial, energy and transport companies in Russia,
- AK&M rating agency compiles the ESG rating of the Russian corporate sector,
- industry ratings of environmental openness are calculated for oil and gas, mining and metallurgical enterprises.

ESG ratings consist of three components: environmental rating (E), social rating (S) and corporate governance rating (G). Table 1 shows the factors and sub-factors that are taken into account when calculating the ESG rating.

**Table 1**  
Factors taken into account when calculating the ESG rating

	Factors	Sub-factors
Attitude towards the environment (Environment)	Natural resources	Water stress Biodiversity Energy use
	Pollution	Waste management and recycling Formation of contaminants Extended product responsibility
	Changing of the climate	Carbon emissions Vulnerability to climate change
	General risks	Stakeholder engagement Supplier chain
	Environment capabilities	Renewable energy Energy productivity Climate adaptation
	Portfolio of environmental assets	Environmentally responsible investments Portfolio of environmental loans
Social responsibility (Social)	Human capital	labor practices Occupational health and safety Attracting and retaining talent Diversity and Inclusion
	Local communities	Social benefits Corporate social responsibility Human rights
	General risks	Supplier network
	Social opportunities	Access to finance Access to communications and logistics
	Portfolio of social assets	Socially responsible investment Social loan portfolio and access to financial services Financial product responsibility
Corporate Governance	Organizational structure	Board structure and transparency Property rights Management of risks
	Corporate behavior	Business ethics Anti-competitive practices Tax payment and transparency

In Russia, one of the most famous is the ESG rating calculated by the Expert RA agency (RAEX-Europe). This rating is compiled monthly based on data from various public sources, including information about the company, news feeds, and more. Table 2 shows the ESG ratings of Russian enterprises calculated in April 2022.

**Table 2**  
ESG ratings of Russian enterprises in April 2022

Company	Industry	Sub- Industry	Rank ESG	Rank		
				E	S	G
Enel Russia	Energy	Electric Utilities (Generation and Transmission)	1	5	1	14
Polymetal	Metals&Mining	Precious metals	2	3	3	19
Credit Bank of Moscow	Financials	Banks	3	1	22	11
NLMK	Metals&Mining	Iron & Steel	4	4	14	9
VimpelCom	Telecom	Wireless Telecommunications Services	5	22	7	12
MTS	Telecom	Wireless Telecommunications Services	6	42	8	1
LUKOIL	Oil&Gas	Integrated Oil & Gas	7	11	28	4
Severstal	Metals&Mining	Iron & Steel	8	9	5	31
Rosneft	Oil&Gas	Integrated Oil & Gas	9	12	9	16
Polyus	Metals&Mining	Precious metals	10	2	24	25
Phosagro	Chemicals	Agricultural Chemicals	11	23	11	3
Uralkali	Chemicals	Agricultural Chemicals	12	16	6	15
SIBUR Holding	Chemicals	Petrochemicals	13	14	12	8
Inter RAO	Energy	Electric Utilities	14	6	35	7
Sistema	Financial services	Holdings	15	30	21	6
NOVATEK	Oil&Gas	Integrated Oil & Gas	16	8	16	28-29
SUEK	Metals&Mining	Coal	17	27	20	5
Moscow Stock Exchange	Financials	Stock Exchanges	18	40	38	2
Russian Railways	Transport	Passenger Transportation, Ground & Sea	19	20	10	43
Gazprom Group	Oil&Gas	Integrated Oil & Gas	20	10	31	41

Source: [https://www.raexpert.eu/esg\\_corporate\\_ranking/](https://www.raexpert.eu/esg_corporate_ranking/)

The first places in this rating were taken by the largest companies from the energy, metallurgical and mining industries, the chemical industry, telecommunications, etc.

ESG ratings are beginning to play an important role in investment policy, as they are used to justify attracting green and social investments (Kachurina, 2021). A high ESG rating for a business shows that it is responsible for controlling and reducing greenhouse gas emissions, recycles waste, and conserves natural resources. For such enterprises, special financing conditions are available, the loan rate is tied to the dynamics of the company's sustainable development indicators, for example, under such conditions, the petrochemical company SIBUR received a loan for \$50 million from UniCredit Bank. In 2020, SIBUR developed and adopted a sustainable development strategy until 2025, which provides for:

- environmental protection (E): reduction of waste by 50%, specific gravity of pollutants in wastewater by 40%, water consumption by 5%,

- Responsible social business conduct (S): 5% reduction in the injury frequency rate, doubling the proportion of women in company management,
- quality of corporate governance (G): development of a circular economy, long-term preservation of the value of products, materials, resources and minimization of industrial and household waste (Zhukova, 2021).

In the last decade, the key trend in the socio-economic development of the world community has been associated with digitalization (Innovative and technological..., 2019). Digitalization has had a significant impact on the development of the service sector (Morozov & Morozov, 2020). Until 2020, the popularity of ESG transformation and digitalization was about the same, but in 2020-21, interest in ESG transformation has skyrocketed.

Table 3 shows the popularity of ESG transformation and digitalization requests in different countries

**Table 3**  
Popularity of requests for ESG and digitalization

Countries	ESG	Digitalization
Taiwan	88%	12%
Hong Kong	83%	17%
Denmark	73%	27%
Canada, UK	72%	28%
USA, Netherlands	71%	29%
France	68%	32%
Republic of Korea, Italy	67%	33%
Sweden, Singapore	64%	36%
Australia	58%	42%
Brazil	52%	48%
India	47%	53%
China	46%	54%
Russia	35%	65%
Japan	34%	66%

Source: <https://trends.google.ru/trends/explore?date=today%205-y&q=%2Fm%2F0by114h,%2Fm%2F0g5r88p>

The highest number of ESG-related searches on Google came from Taiwan (88%), Hong Kong (83%), Denmark (73%), Canada and the UK (72% each). This allows us to conclude that it is in these countries that ESG transformation is given great attention and it has become the main ideology of sustainable development for many enterprises.

The implementation of the ESG concept is closely related to digital technologies, which are the technological basis for achieving ESG goals. Various digital technologies are used to implement ESG projects, including the Internet of Things, robotization, artificial intelligence, big data, virtual reality, machine learning, etc.

Directions for the use of digital technologies in ESG projects:

- Industrial Internet of Things (IIoT) technologies provide control and management of technological processes and harmful emissions generated by the production activities of an enterprise, they are used to monitor the environmental situation, manage energy resources, etc.,

- systems of environmental monitoring, video analytics, geopositioning make it possible to simulate the state of atmospheric air online and, in case of deviations from the specified parameters, apply regulatory solutions,
- digital twins are virtual copies of real production facilities, they are used to test production and technological processes to identify possible failures, emergencies, etc.,
- technologies for collecting and processing big data make it possible to build a system of predictive analytics and predict possible failures and accidents in the operation of complex technological equipment,
- virtual reality technologies are used in the creation of VR simulators for training technical personnel, the formation of professional competencies and skills for trouble-free operation, - corporate digital platforms ensure the creation of a single information space of the enterprise to improve the quality of corporate governance.

An example of the use of digital technologies for ESG transformation is the petrochemical industry. Oil and gas and chemical companies were among the first to get involved in the implementation of the ESG principles. Lukoil receives 6% of its electricity needs from renewable sources, in particular, uses solar energy. Shell is using digital technologies to make filling stations more efficient, safer and more environmentally friendly.

Virtual and augmented reality technologies, in particular, VR simulators, are being introduced at enterprises in the petrochemical industry to develop safe production skills. They allow to improve the quality of employee training, to consolidate the skills of behavior in case of equipment breakdown or disruption of the technological cycle, etc.

Digital twins are created on the basis of industrial Internet of Things technologies with the connection of Big Data analytics and provide 3D visualization of objects. This allows you to simulate the operation of equipment in various, including critical and emergency conditions, provides monitoring and diagnostics of industrial systems. Virtual digital twins can be created for individual products, technological processes, workshops or an industrial enterprise as a whole. One of the main advantages of digital twins is that they allow you to check the algorithms of equipment operation in advance in case of emergency situations. About 90% of all questions about the performance of equipment are removed at the stage of checking its functioning on a digital twin. Digital twins, being a computer model of a real object, are created on the basis of specialized digital platforms (Dozortsev, 2021). In Russia, from January 1, 2022, the national standard GOST R57700.37–2021 “Computer models and modeling. Digital twins of products. General Provisions”, which defines the requirements for the creation and use of digital twins. By 2024, it is planned to introduce digital twin technology at 250 Russian enterprises, 145 billion rubles have been allocated for this.

Currently, many Russian companies are engaged in the development and implementation of digital twins. The greatest application of digital technologies is found in the automotive industry, mechanical engineering, aircraft manufacturing, the oil and gas industry, and energy. Among the developers of digital twins, it should be noted such companies as Russian Railways, Rosatom, Rostec, Gazpromneft, JSC Russian Helicopters, JSC UEC-Klimov, PJSC UEC-Saturn and others. Developments to create an electronic twin are carried out by the Novocherkassk Electric Locomotive Plant, which has created digital simulation models of the assembly, repair, and paint shops. In the future, a 3D model of the enterprise will be created, which will simplify the launch of new types of products and ensure the digitalization of key production units. Gazprom Neft has created a digital twin of the process of lifting fluid from wells, which makes it possible to optimize the operation of wells, predict emergency situations, and conduct a preventive assessment of the operation of the system in case of a change in its configuration.

Digitalization is the most important factor in sustainable development and implementation of the ESG transformation. The processes of digital transformation and ESG transformation must be synchronized in order



to obtain a synergistic effect. Recently, the term ESdIGital has been used in the scientific literature, denoting the unity of ESG and Digital transformation.

The strategic ESG transformation of enterprises is carried out with the aim of increasing their long-term competitiveness and resilience in the new normal. Enterprises are beginning to actively engage in ESG transformation to ensure strategic competitiveness both domestically and globally.

The main areas of ESG transformation of enterprises include the following:

- modernization of physical assets to comply with ESG principles,
- implementation of a climate management system and management of greenhouse gas emissions,
- development and implementation of energy saving measures both at the level of individual production operations, structural divisions, and the enterprise as a whole,
- transition to closed cycle technologies, efficient use of resources through their recycling within the framework of biological and technological cycles, the use of renewable energy sources, reducing the negative anthropogenic impact on the environment,
- inclusion of non-financial ESG information in the reporting of enterprises, etc.

At the moment, most large companies, when disclosing information about sustainable ESG development, are guided by the reporting standards in the field of sustainable development (Global Reporting Initiative, GRI), which contain a universal set of criteria for evaluating corporate activities aimed at ensuring sustainable development.

However, unified standards for non-financial reporting have not yet been developed, there is no single interpretation and understanding of what the ESG rating shows. A significant problem is the lack of mandatory ESG reporting of enterprises in Russia. In July 2021, the Bank of Russia issued recommendations on the disclosure of non-financial information related to the activities of public joint-stock companies (PJSCs). This reporting includes information on the company's sustainable development strategy, social management, environmental and social aspects of activities, relationships with employees, the fight against corruption, and so on. It should be emphasized the increasing role of non-financial information for investors, who, in addition to the traditional assessment of economic efficiency, began to pay attention also to the impact of the enterprise on the environment and society. ESG transformation requires significant investment, including so-called responsible investment, but obviously government support is needed to stimulate the ESG transition. Socially responsible investment is the process of making investment decisions, in which, along with the traditional financial assessment of the effectiveness of investments, the social and environmental consequences of the implementation of these investments are considered (Ten & Pokushalov, 2021).

Responsible investment means the compliance of the investee with a certain set of social, environmental and governance ESG criteria. Responsible investors aim to strike a balance between financial and public interests. The new generation of investors prefers to finance mainly those companies that minimize environmental damage, take care of the implementation of social norms for employees, i.e. adhere to the principles of ESG (Pilyugina & Lasunova, 2020).

ESG's responsible investment tools make it possible to attract financial resources for the implementation of projects aimed at preserving the environment and developing the so-called green economy. An example of responsible green financing is the issue in December 2021 by Ecoline-Vtorplast of green bonds for 2 billion rubles. In 2021, the public sustainable finance market in Russia has grown more than sixfold. Russian banks began to

issue green loans with the lending rate tied to the ESG ratings of borrowing companies. The largest banks Sberbank, VTB, Gazprombank, Russian Agricultural Bank and others have developed and are implementing strategies for ESG lending to clients. However, at the moment, only 7% percent of Russian banks use ESG principles, 67% are preparing to switch to ESG investment principles.

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#### 4. Conclusions

Thus, the transition of Russian enterprises to ESG strategies is objectively due to the sustainable development policy that has been developed by the world community. Already now, companies that invest in their sustainable development and share the principles of ESG are valued on average 10% higher than companies that do not follow these principles. One of the most problematic issues is the search for sources for the implementation of the ESG transformation of enterprises. ESG investment programs of enterprises are usually implemented at their own expense, which is very burdensome from a financial point of view. However, foreign practice of such ESG investments suggests that they pay off in the medium and long term. For Russian enterprises, such a source of financing as green bonds and obtaining loans at special rates, taking into account ESG ratings, becomes available. Banks also consider these instruments as promising and begin to actively develop them. In addition, ESG criteria are becoming a prerequisite for enterprises to take the lead. In this regard, ESdIGital-transformation of enterprises becomes a necessary condition for maintaining its competitiveness.

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