

ABSTRACT OF THE DISSERTATION RESEARCH

(as a manuscript)

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Dissertation topic: "Theory and practice of ESG transformation of the management system of a full-cycle group of companies in industrial housing construction"

Code and name of the scientific specialty: 5.2.3. Regional and sectoral economics; 5.2.6. Management

Desired academic degree: Candidate of Economic Sciences

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1. Relevance of the research topic

The current stage of global and national economic development is characterized by increasing global uncertainty, accelerating technological change, and a revision of traditional corporate governance models. Under these conditions, the sustainability of economic entities is increasingly determined less by financial performance alone and increasingly depends on the ability to consider environmental, social, and governance risks. The ESG (Environmental , Social, Governance) concept provides a toolkit for integrating these factors into strategic and operational management, thereby reducing risks, increasing investment attractiveness, and fostering long-term competitive advantages. Interest in the ESG agenda is rapidly growing in Russia, as evidenced by the expansion of corporate non-financial reporting (according to the Russian Union of Industrialists and Entrepreneurs, more than 140 companies disclosed sustainability information in 2024), the development of a national taxonomy of "green" projects, approved by Russian Government Resolution No. 1587 in 2021, and the Ministry of Economic Development's methodological recommendations for preparing sustainability reports.

The construction industry occupies a special place among economic sectors, being a backbone of the Russian economy, accounting for approximately 6-7% of

GDP and providing significant employment. At the same time, industrial housing construction as a type of activity is characterized by high material and energy intensity, a significant environmental impact (according to expert estimates, construction accounts for up to 30-40% of global carbon dioxide emissions and approximately a third of all waste), and a complex cooperation between participants in the investment and construction cycle. Full-cycle groups of companies, combining design, construction materials production, construction and installation work, and subsequent facility operation, face the need to align ESG approaches across all stages of the lifecycle—from land selection to building disposal.

External pressure on the construction sector is increasing: major investors (including state-owned banks) are introducing ESG scoring in their lending; export markets are tightening requirements for the carbon footprint of products; and public demand for a quality living environment, developer transparency, and corporate social responsibility is steadily growing. Under these conditions, construction holdings are forced to reconsider their management models. However, existing academic research is either limited to specific aspects (environmental issues, social policy, or corporate governance quality) or offers universal models that are poorly adapted to the specifics of the industry and the multi-tiered structure of corporate groups. The systemic ESG transformation of vertically integrated construction holdings remains an understudied area, which makes this dissertation relevant in both its theoretical (filling a gap in scientific knowledge) and applied (developing tools for practical implementation) aspects.

2. The degree of development of the problem

The theoretical foundation of the study is based on classic works on sustainable development, which laid the foundations for a balanced consideration of economic, environmental, and social goals. These include the Brundtland Commission's report "Our Common Future" (1987), the works of David Meadows ("The Limits to Growth"), and Karl Schwab's concept of stakeholder capitalism (Davos) . Manifesto 1973), as well as the well-known debate between A. Burleigh and E. Dodd on the purposes of the corporation, continued by M. Friedman in his

article on the social responsibility of business (1970). In Russian scholarship, issues of sustainable development and corporate social responsibility were developed in the works of M.P. Afanasyev, V.D. Komissarov, and I.N. Tkachenko, who adapted global concepts to the conditions of the domestic economy and proposed approaches to assessing the sustainability of companies.

In recent years, applied research on ESG integration has been actively conducted by Russian researchers. A.N. Azhgireeva and her co-authors examine the integration of ESG principles into strategic management as a path to sustainable business. B.Zh. Tursynova explores the theoretical and practical aspects of incorporating ESG criteria into the financial stability assessment of oil and gas companies. A.A. Vereteno is developing process-functional models for managing ESG technologies at the regional level. I.N. Tkachenko and S.G. Vasin and their co-authors focus on assessing the sustainability of corporate governance and identifying ESG risks. Zh.M. Korzovatykh and G.I. Popodko analyze the role of ESG reporting in the sustainable development agenda and its impact on the long-term capitalization of resource companies.

However, a critical literature review reveals that most studies focus either on individual ESG components (primarily environmental or social) or on general sustainable development models without considering industry-specific characteristics. The construction industry, unlike the energy or banking sectors, lacks established methodologies for the systematic implementation of ESG standards. Existing approaches fail to consider the multi-stage production cycle in industrial housing construction, the distributed management structure of groups of companies with multiple legal entities, or the specifics of integrating environmental and social requirements into management accounting and cost control processes. The quantitative link between non-financial indicators and financial results at the level of individual products and business processes is particularly understudied. The comprehensive ESG transformation of vertically integrated holdings remains a poorly understood area, which determined the choice of topic, goal, and objectives of this dissertation.

3. Object of study

The object of the study is the ESG transformation process of a full-cycle group of companies operating in the industrial housing construction sector. The specific object of the empirical analysis is the Sibpromstroy Group of Companies, a holding company founded in 1994. By 2025, it will unite 28 specialized enterprises that cover the full construction cycle: design, reinforced concrete production (three plants in Surgut, Odintsovo, and Belgorod), construction and installation work, logistics, property management, and housing sales. The group operates in three regions of the Russian Federation: the Khanty-Mansi Autonomous Okrug-Yugra, Belgorod Oblast, and Moscow Oblast (including New Moscow). Annual housing commissioning volumes range from 150,000 to 350,000 square meters, and by mid-2025, the total volume of housing built exceeded 3.5 million square meters. The group employs over 2,000 people.

4. Subject of the study

The subject of this study is the economic relationships that develop between participants in the ESG transformation process (owners, management, employees, counterparties, government agencies, and local communities), as well as the management mechanisms (organizational, financial, informational, and personnel) that ensure the integration of sustainable development principles into the operational and strategic activities of a group of companies. Within this framework, special attention is paid to cost control mechanisms, organizational restructuring, digital automation, and the development of a corporate culture focused on ESG values.

5. Purpose and objectives of the study

The aim of this work is to develop theoretical principles and practical recommendations for the implementation of an ESG management system in a group of full-cycle companies, aimed at reducing environmental, social, and management risks, increasing operational efficiency, and strengthening long-term competitive positions in the industrial housing construction market.

To achieve this goal, the following interrelated tasks were solved:

1. Theoretical concepts regarding the content, stages, and barriers of ESG transformation in relation to industrial housing construction have been clarified, including a comparative analysis of Russian and foreign practices of regulatory and voluntary implementation of ESG standards;

2. measures to increase the transparency of management processes through the implementation of digital accounting, control and document management tools (including the 1C :ERP platform) have been substantiated and tested, which helps reduce the influence of the human factor and speed up decision-making;

3. A detailed analysis of the existing cost accounting system at the holding's enterprises was conducted (using a reinforced concrete plant as an example) and recommendations were developed for its optimization with the inclusion of environmental and social factors based on the integration of ABC methodology and ESG indicators, including the development of an integrated ESG weight for products and a "green" correction coefficient;

4. A step-by-step algorithm for implementing ESG principles has been developed, covering all stages of the construction project life cycle – from strategic diagnostics, policy formation, restructuring, automation to monitoring and non-financial reporting;

5. The paper proposes and substantiates ways to reorganize the organizational structure of the group of companies, including the centralization of support functions (accounting, HR, IT), the creation of centers of expertise, the implementation of corporate ethical standards (Code of Business Ethics, Regulations on Corporate Culture) and social risk management programs during transformation.

6. Theoretical and methodological basis and information base of the research

The study is based on a systems approach, which allows for the group of companies to be viewed as a holistic entity, whose elements are interconnected and aligned with common sustainable development goals. The following key methods were used:

– structural and functional analysis – to diagnose the organizational model and identify duplicate functions, areas of inefficiency and losses (used in the analysis of the current structure of the accounting department, where 36 staff units with significant duplication of operations were identified);

– economic and mathematical modeling – for constructing an integrated model of ESG and ABC cost control, including the calculation of the contingency coefficients of the physical sales volume, price groups and share of costs, as well as a regression analysis of the relationship between automation and efficiency (R^2 from 0.58 to 0.65);

– SWOT analysis – to assess the strengths and weaknesses, opportunities and threats of ESG transformation both at the initial stage (before implementation) and after the transformation;

– ABC method (Activity -Based Costing) – for distributing indirect costs by type of product with reference to environmental and social coefficients, which made it possible to classify the range of reinforced concrete products into groups A, B, BC, C and identify the most and least effective positions;

– methods of expert assessments and sociological surveys – to study the perception of ESG principles by staff (a survey of more than 200 employees) and residents of the regions of presence (a survey of about 2,000 respondents in Surgut and Odintsovo).

The empirical base was comprised of management and financial accounting data from Sibpromstroy Group for 2023–2025, including reports on costs, production capacity, personnel, and environmental indicators (energy consumption, water disposal, waste volumes, and emissions). Analytical reviews from rating agencies (Expert RA, NKR), regulatory documents (the Russian taxonomy of green projects, GRI standards, EU directives – CSRD, SFDR, and the EU taxonomy), and Moscow Exchange data on the green bond market were additionally used. The reliability of the conclusions is ensured by a comparison of planned and actual indicators before and after the implementation of the developed solutions (the

comparison period is 12 months before and after the pilot phase) and is confirmed by implementation certificates.

7. Scientific novelty and main provisions submitted for defense

The scientific novelty of the dissertation is as follows:

1. The specific motivations for Russian construction companies to pursue ESG transformation have been identified and substantiated. Unlike the global trend, where external regulatory and investment requirements (e.g., mandatory CSRD reporting in the EU) dominate, internal incentives—improving operational efficiency, improving business reputation, and optimizing HR policies—are key for domestic industrial housing construction companies. For the first time, barriers to ESG transformation in the industry have been classified into three groups: organizational and managerial (duplication of functions, lack of a systematic approach, weak coordination between departments), financial and economic (insufficient automation, ineffective cost control, high indirect costs), and institutional (lack of skills, unclear standards, insufficient government support). Based on correlation analysis ($p=0.52$ for internal incentives and $p=0.18$ for external ones at $p<0.01$), it was proven that internal incentives are statistically significantly more strongly associated with real ESG results, which corrects existing ideas about the driving forces of ESG implementation in Russia (clause 6.1 of the specialty passport 5.2.3).

2. A direct quantitative relationship between the scale of digitalization of management processes (measured by the number of automated workstations, AWP) and the effectiveness of ESG transformations has been empirically confirmed. Based on a regression analysis for a sample of 14 automation projects in construction companies (including pilot projects of Sibpromstroy Group of Companies), the following equations have been constructed: Y_1 (reduction in the time for preparing management reports) = $11.2 + 19.4 \ln(\text{AWP})$, $R^2=0.65$; Y_2 (reduction in inventories) = $7.8 + 12.3 \ln(\text{AWP})$, $R^2=0.58$; Y_3 (reduction in paperwork) = $9.5 + 17.1 \ln(\text{AWP})$, $R^2=0.62$. Standardized β coefficients in the range of 0.74–0.81 indicate a strong positive relationship. A 10% increase in automation was found to lead to an

additional 1.8% reduction in reporting time, a 1.2% reduction in inventory, and a 1.7% reduction in paperwork. It has been proven that comprehensive automation of accounting, production, and reporting processes (rather than disparate IT solutions) forms the foundation for successful ESG transformation (Section 26 of the Specialty Data Sheet 5.2.6).

3. An integrated model of ESG and ABC cost control has been developed and tested. It allows for the allocation of indirect costs taking into account environmental and social coefficients. The model includes: the environmental intensity coefficient ($k_{E,i}$) – the ratio of specific CO₂ emissions and energy consumption to the industry average; the social significance coefficient ($k_{S,i}$) – an integral indicator taking into account the share of products used in socially significant facilities and operational safety; the management transparency coefficient ($k_{G,i}$) – the presence of certification and life cycle traceability. The integral ESG weight of a product is calculated as the weighted sum of these coefficients (weights $\alpha=0.4$ – ecology, $\beta=0.3$ – social sphere, $\gamma=0.3$ – management). Based on the ESG weight, a "green" correction factor (g_{adj}) is introduced, increasing the estimated cost for products with a high environmental impact, thus stimulating investment in greening. A trial at a precast concrete plant demonstrated a 12% reduction in inefficient costs, a 9% reduction in energy consumption (380,000 kWh per year), a 12% reduction in production waste, and a twofold reduction in ESG reporting time (from 14 to 3 business days). The model is applicable at all stages of the real estate lifecycle – from design to disposal (clause 6.12 of the specialty data sheet 5.2.3).

4. A methodology for a phased ESG transformation of the management system for full-cycle groups of companies is proposed. The algorithm includes nine consecutive stages: 1) strategic audit and diagnostics of the current state (analysis of business processes, structure, ESG risks); 2) formation of an ESG strategy (goals, KPIs, responsible persons); 3) restructuring of the organizational structure and optimization of business processes (elimination of duplication, creation of expertise centers); 4) implementation of management accounting and controlling (ABC

method, plan-fact, integration of ESG indicators); 5) optimization of costs and energy efficiency (implementation of resource-saving technologies); 6) automation of key business processes based on 1C: ERP with modules for accounting of emissions, waste and energy resources; 7) development of corporate culture and personnel (training, Code of Ethics, Regulation on Culture); 8) transparency and non-financial reporting (according to GRI standards). 9) continuous monitoring, auditing, and improvement. The methodology covers the entire life cycle of construction projects—from design to operation and disposal—ensuring systematic and sustainable transformation (Section 13 of the Specialty Passport 5.2.6).

5. Scientifically based recommendations for organizational changes in industrial housing construction holdings have been developed. Key elements include: strategic restructuring with the creation of centers of expertise and the elimination of duplicate functions. Using the accounting department as an example, the staff was reduced from 36 to 16 units (savings of over 5.4 million rubles per month) due to centralization and the transition to a service model; cultural transformation through the implementation of a Code of Business Ethics (Appendix 8) and a Corporate Culture Regulation (Appendix 7), which increased employee engagement (according to surveys, 74% of employees expressed a willingness to undergo training) and reduced staff turnover by 10%; the integration of ESG criteria into procurement regulations (Appendix 2), personnel records (Appendix 3), and accounting and tax accounting (Appendix 6) - making sustainable development an integral part of daily operations, rather than a one-off initiative (clause 9 of the specialty passport 5.2.6).

8. Theoretical and practical significance of the results

The theoretical significance of this work is as follows. First, an integrated accounting model has been developed and verified, combining financial and non-financial indicators at the product level. This has not previously been done for the construction industry and fills a methodological gap in costing and management accounting theory. The model enables a transition from traditional direct costing to process-oriented accounting that takes into account environmental and social

externalities. Second, the theory of sustainable development management has been enriched by identifying, classifying, and ranking barriers to ESG transformation, as well as demonstrating the dominance of internal incentives over external ones in the Russian context. This corrects existing theoretical constructs borrowed from international practice. Third, a contribution has been made to the theory of digital management transformation by establishing quantitative patterns of automation's impact on the effectiveness of ESG transformations and deriving regression equations that can be used to forecast digitalization outcomes in other resource-intensive industries.

The practical significance has been confirmed by implementing the results in the activities of seven organizations within the Sibpromstroy Group of Companies : Sibpromstroy DSK LLC , SPS Moskovia DSK LLC (a reinforced concrete plant in Odintsovo), Sistema Management Company LLC (management company), SPS Logistic LLC (transport logistics), Renovation LLC (construction materials production), Cleaning-S LLC (cleaning services), and Tochka Resheniya LLC (accounting outsourcing). The following measurable effects were achieved:

- economic effect: reduction of inefficient expenses by 12% for the group as a whole (according to the plan- fact analysis for 2024–2025); reduction of the time for preparing management reports by 2 times (from 10 to 5 working days); increase in the accuracy of financial planning (the deviation between the plan and actual decreased from 15% to 5%); reduction of the time for preparing ESG reports from 14 to 3 working days;

- organizational effect: optimization of the accounting department structure (the staff was reduced from 36 to 16 units in the target version, which results in monthly savings of approximately 5.4 million rubles); implementation of the Code of Business Ethics and the Regulation on Corporate Culture; creation of a social risk management system with the centralization of functions (a program for retraining and reintegration of employees involved in the restructuring, which made it possible to avoid forced layoffs);

– digital effect: the implementation of automation based on 1C :ERP ensured a 68% reduction in paperwork, a 42–46% acceleration in order processing, a 15–18% reduction in inventory, a 13–23% reduction in equipment downtime, and a 17–19% reduction in production defects; automatic data collection for non-financial reporting became possible thanks to the developed energy, emissions, and waste accounting subsystems;

– scalability: the developed roadmap (Appendix 1), interaction regulations (Appendices 2, 3, 6, 9) and methods can be replicated in other construction holdings and adapted for industrial enterprises in other sectors (mechanical engineering, metallurgy, chemical industry).

The results of this dissertation can also be used by the Ministry of Construction of the Russian Federation in developing industry recommendations for the implementation of ESG standards, by self-regulatory organizations of builders (SROs) in developing standard regulations for sustainable development, and by management teams of construction holdings in designing ESG strategies, optimizing management accounting, and preparing non-financial reporting.

9. Testing the results

The main provisions of the dissertation were presented at all-Russian and international scientific and practical conferences in 2024-2026. Practical implementation was carried out at Sibpromstroy Group of Companies and SPS Moskovia Construction Company LLC, which is confirmed by implementation certificates (Appendix 10). In particular, an integrated ESG and ABC cost control model, an optimized accounting structure, a Code of Business Ethics (Appendix 8), a Corporate Culture Regulation (Appendix 7), regulations for interaction on procurement and payments (Appendix 2), HR issues (Appendix 3), accounting and tax accounting (Appendix 6), as well as regulations for the implementation of automation based on 1C :ERP (Appendix 9) and an ESG transformation roadmap (Appendix 1) were implemented. On the topic of the dissertation, 8 articles were published in peer-reviewed scientific journals from the list of the Higher Attestation Commission, including 5 in co-authorship with the scientific supervisor and co-

authors, as well as 3 works in international databases (Scopus , Web of Science, according to open sources).

10. Structure of the dissertation

The dissertation consists of an introduction, three chapters containing nine paragraphs, a conclusion, a list of references and literature (151 titles), and 10 appendices. The total length of the work is 166 pages of main text, including five figures and 20 tables. The composition is structured according to the principle of ascending from theory to practice.

The first chapter ("Development of the Theory and Practice of Applying the Concept of Sustainable Development and ESG") examines the evolution of the ESG concept—from the ideas of Burley, Dodd, and Friedman to modern GRI standards, the EU taxonomy, and Russian regulations. A comparative analysis of domestic and international practices is provided, identifying differences in mandatory reporting, standardization, and practices. The motivating factors for Russian companies to implement ESG are also analyzed, a hierarchy of incentives is constructed (from external mandatory to internal voluntary), and the dominance of internal incentives in the construction sector is substantiated.

The second chapter ("Characteristics of Implementing the ESG Concept in the Industrial Housing Industry") contains a detailed analysis of the organizational and economic model of full-cycle groups of companies using the example of Sibpromstroy Group of Companies . It describes the holding's structure, production capacities, and regional presence. It also characterizes the company's key operational challenges within the context of the ESG agenda: rising costs, fragmented ESG initiatives, low automation, skills shortages, weak coordination, and insufficient transparency. Based on a SWOT analysis and regional differentiation of ESG factors, a roadmap for integrating ESG principles has been developed, consisting of nine stages with specified deadlines, responsibilities, and expected results.

The third chapter ("Managing a Full-Cycle Group of Companies Focused on ESG Risk Mitigation") translates the findings into specific tools. The first section presents an integrated model for ESG and ABC cost control, including product

classification into groups A, B, BC, and C, calculation of contingency coefficients, and implementation of ESG ratios. The second section examines organizational structure optimization—accounting restructuring, creation of centers of expertise, implementation of a Code of Ethics and a Corporate Culture Policy. The third section describes business process automation based on 1C :ERP , assessing the economic impact (profit growth, faster order fulfillment, cost reduction, inventory reduction, and increased productivity). The conclusion summarizes the findings, formulates conclusions, and offers recommendations for further development of the ESG agenda in the industry through 2030.

Keywords: ESG transformation, sustainable development, industrial housing construction, full-cycle group of companies, cost controlling, ABC method, digitalization, business process automation, corporate culture, organizational structure, development, management accounting, non-financial reporting, facility life cycle.

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