

# FROM ESG FRAMEWORKS TO RESPONSIBLE INVESTMENT: FINANCIAL MATERIALITY IN THE REPUBLIC OF MOLDOVA THROUGH THE LENS OF EU EXPERIENCE

**Ilona RUDENCO**

Technical University of Moldova, Republic of Moldova

[ilona.rudenco@em.utm.md](mailto:ilona.rudenco@em.utm.md)

**Rina TURCAN**

Technical University of Moldova, Republic of Moldova

[rina.turcan@emin.utm.md](mailto:rina.turcan@emin.utm.md)

## **Abstract:**

*This article examines the transition from ESG frameworks to responsible investment through the lens of financial materiality, with particular emphasis on the Republic of Moldova and the relevance of European experience. The study argues that ESG should no longer be interpreted only as an ethical or reputational concern, but as a set of factors that may influence enterprise value, risk exposure, access to finance, cash flows and long-term competitiveness. The research is based on qualitative documentary analysis, comparative analysis and descriptive interpretation of selected secondary indicators related to sustainable finance, green bonds, renewable energy, climate risks, innovation and circular economy. The results show that, while the European Union and Romania have advanced toward the practical implementation of responsible investment instruments, Moldova remains at the stage of institutional formation. The Moldovan sustainable finance agenda is mainly shaped by the Sustainable Finance Roadmap, banking-sector modernization, energy-security concerns, donor support and gradual alignment with European requirements. The study highlights that ESG frameworks may influence Moldovan enterprises indirectly through banks, investors, export partners, reporting expectations and value chains. The article concludes that responsible investment in Moldova should develop through measurable priorities, including green lending, improved reporting, climate risk assessment, energy efficiency and investment readiness of manufacturing enterprises.*

**Key words:** Sustainable finance, green bonds, corporate sustainability reporting; enterprise resilience.

**JEL classification:** G11; G18; Q56

Received 20 March 2026; Accepted 15 June 2026

## **1. INTRODUCTION**

The development of responsible investment should be understood not merely as a global expansion of ESG-related terminology, but as part of a broader transformation in the way enterprises, financial institutions and investors assess risk, value creation and long-term competitiveness. In recent years, environmental, social and governance factors have increasingly moved from the periphery of corporate responsibility debates toward the core of financial analysis, investment decision-making and access to capital. This shift is particularly relevant for the Republic of Moldova, whose economy is small, open and strongly influenced by external regulatory, financial and trade requirements. In this context, ESG-oriented investment is not yet a fully institutionalized practice, especially among manufacturing enterprises, but rather an emerging direction shaped by European integration, banking-sector modernization, energy vulnerability, export dependence and the need for greater corporate transparency. This interpretation is consistent with the Sustainable Finance Roadmap adopted by the National Bank of Moldova, which places ESG risks, sustainable finance governance and institutional capacity-building within the national financial policy agenda (*Press Release on the Approval of the Sustainable Finance Roadmap | National Bank of Moldova, 2024.*).

In this article, responsible investment is approached as a set of investment and financing decisions that incorporate environmental, social and governance factors into the assessment of enterprise value, risk exposure, capital allocation and long-term financial sustainability. Such an understanding makes it possible to move beyond a narrow ethical interpretation of responsible investment and to examine ESG as a practical financial mechanism. From this perspective, ESG

factors do not replace conventional financial indicators, but complement them by revealing risks and opportunities that may affect profitability, access to finance, investment attractiveness and enterprise resilience. Pedersen, Fitzgibbons and Pomorski argue that ESG characteristics may influence investment decisions both through their informational value for firm fundamentals and through investor preferences (Pedersen et al., 2019). Therefore, ESG integration may be understood as a way of broadening the informational basis of investment decisions, particularly in markets where financial risks are increasingly connected with environmental pressures, social expectations and governance quality.

For the Republic of Moldova, the practical significance of responsible investment is related to the gradual transition from general sustainability declarations to more structured requirements concerning disclosure, risk management and corporate governance. The Sustainable Banking and Finance Network identifies Moldova's adoption of the Sustainable Finance Roadmap for 2024–2028 as an important stage in the formation of the national sustainable finance framework (Global Progress Report, 2025). This development suggests that Moldovan banks, regulators and enterprises will increasingly be expected to consider ESG-related risks when making financial and investment decisions. At the same time, the relevance of ESG in Moldova should not be reduced to formal alignment with international terminology. Its importance lies in the way sustainability-related factors may influence production costs, creditworthiness, export opportunities, investor confidence and the strategic positioning of enterprises in regional and European markets.

The international ESG environment is marked by a growing number of regulations, standards and methodological frameworks. However, for Moldovan enterprises, these frameworks should not be viewed as an abstract catalogue of external requirements. Their relevance derives from the fact that they increasingly shape the expectations of banks, investors, export partners, international organizations and public authorities. Thus, the central issue is not only which ESG frameworks exist, but how they may affect the financial behavior, reporting discipline and strategic decisions of enterprises operating in the Republic of Moldova. This is especially important for manufacturing companies, which are often exposed to energy costs, resource inefficiencies, technological modernization needs, supply-chain requirements and external market standards.

The Corporate Sustainability Reporting Directive (CSRD) and the European Sustainability Reporting Standards (ESRS) are particularly important in this regard, given Moldova's economic orientation toward the European Union. The European Commission states that the first companies subject to CSRD must apply the new rules for the 2024 financial year, with reports published in 2025, and that sustainability reporting should be prepared in accordance with ESRS (*European Green Deal*, 2025). Although many Moldovan enterprises are not directly subject to CSRD obligations, they may be affected indirectly through value chains, foreign investors, credit institutions and European business partners. A Moldovan manufacturing company supplying goods or components to EU-based firms may increasingly be required to provide information on emissions, energy use, labor practices, governance quality, supplier responsibility and other sustainability-related indicators. In this sense, ESG reporting becomes not only a matter of regulatory compliance, but also a condition for export adaptability, business continuity and participation in European value chains.

The IFRS Sustainability Disclosure Standards, particularly IFRS S1 and IFRS S2, strengthen the financial dimension of sustainability disclosure. IFRS S1 establishes general requirements for disclosing sustainability-related risks and opportunities that may affect enterprise value, while IFRS S2 focuses on climate-related risks and opportunities. The IFRS Foundation also notes that the ISSB standards build on and mark the culmination of the work of the task force on climate-related financial disclosures (*IFRS - IFRS Sustainability Standards Navigator*, 2025). For Moldovan manufacturing enterprises, these standards are relevant because they connect sustainability information with financial materiality. Energy costs, resource efficiency, climate-related disruptions, supply-chain interruptions and technological modernization may directly influence production costs, operating margins, cash flows and investment decisions. Therefore, sustainability-related information becomes financially meaningful when it helps explain the factors that may affect the future performance, risk profile and resilience of an enterprise.

The GRI Standards perform a complementary function, as they focus on the broader impacts of corporate activity on the economy, society and the environment. The revised GRI Universal Standards have been effective for reporting from 1 January 2023 and emphasize impact reporting, stakeholder engagement and material topics (*GRI - Standards*, 2021). In the Moldovan context, this approach may be useful for enterprises that need to demonstrate responsibility toward employees, local communities, suppliers and public authorities. For manufacturing companies, GRI-related indicators can help systematize information on waste management, occupational safety, resource consumption, labor conditions and stakeholder engagement. However, the effective application of such standards requires reliable internal data systems, managerial capacity and reporting discipline, which remain significant challenges for many small and medium-sized enterprises.

The EU Taxonomy represents another important reference point because it defines the conditions under which an economic activity may be considered environmentally sustainable. The European Commission explains that the Taxonomy Regulation establishes six environmental objectives, including climate change mitigation, climate change adaptation, sustainable use of water and marine resources, transition to a circular economy, pollution prevention and control, and protection of biodiversity and ecosystems (*EU Taxonomy for Sustainable Activities - Finance - European Commission*, 2026). For the Republic of Moldova, the taxonomy is relevant not only as a European classification system, but also as an indication of future investment priorities. Activities related to energy efficiency, circular economy, pollution prevention, renewable energy and sustainable resource management may become more attractive for banks and investors. At the same time, taxonomy-oriented expectations may generate adaptation costs for enterprises that operate with outdated technologies, high energy intensity or insufficient environmental monitoring..

The Principles for Responsible Investment (PRI) and the Equator Principles further demonstrate that ESG integration is increasingly embedded in investment and project-finance decisions. The PRI framework requires signatories to incorporate ESG issues into investment analysis and ownership practices, to seek ESG disclosure from investee entities and to report on implementation progress (PRI Association, n.d.). The Equator Principles serve as a financial industry benchmark for identifying, assessing and managing environmental and social risks in projects (The Equator Principles, 2020). Although Moldovan enterprises may not interact directly with all these frameworks, the logic behind them is becoming increasingly relevant for national financial institutions. Banks and investors may gradually move beyond traditional assessments based only on collateral and repayment capacity, placing greater emphasis on environmental exposure, governance quality, social risks and the long-term sustainability of business models.

The development of responsible investment is influenced by both external and internal drivers. External drivers include European integration, international regulation, banking-sector requirements, export-market expectations, investor pressure, energy transition and public policy. Internal drivers include enterprise strategy, financial discipline, managerial capacity, corporate governance, technological modernization, environmental awareness and the quality of internal information systems. Drawing on bibliometric and systematic analysis, Chițimiea et al. demonstrate that green and responsible investment decisions are influenced by a combination of institutional, market, organizational and environmental factors (Chițimiea et al., 2021). This multidimensional perspective is particularly useful for Moldova, where ESG integration depends not only on the existence of external standards, but also on the capacity of enterprises to translate these standards into operational and financial decisions.

At the same time, internal drivers determine whether responsible investment can generate real financial benefits. If ESG activities are implemented only formally, without being connected to financial planning, production management and corporate governance, their impact on performance is likely to remain limited. By contrast, when ESG principles are linked with energy efficiency, cost control, risk management, employee development, technological renewal and market positioning, they may contribute to stronger financial outcomes. This distinction is important because responsible investment should not be presented as automatically profitable. Friede et al., in a review of more than 2,000 empirical studies, find that the majority of studies report a non-negative relationship between

ESG and corporate financial performance, but this does not mean that ESG produces uniform results across all sectors and countries (Friede et al., 2015). Whelan et al. also show that the financial effects of ESG depend on how sustainability practices are implemented, measured and connected with business strategy (Whelan et al., 2021).

Therefore, the research problem addressed in this article concerns the extent to which ESG frameworks, developed mainly within international and European sustainable finance agendas, can be interpreted as financially material for enterprises in the Republic of Moldova. The article argues that, in the Moldovan context, ESG integration should not be viewed only as a matter of ethical responsibility or formal compliance, but as a factor that may influence access to finance, risk exposure, production efficiency, export competitiveness and long-term investment attractiveness. Through the lens of EU experience, the study aims to examine how ESG frameworks may support the transition toward responsible investment and how financial materiality can help Moldovan enterprises and financial institutions distinguish between sustainability actions with symbolic value and those with measurable economic relevance.

The contribution of the article is threefold. First, it systematizes the main ESG and sustainable finance frameworks that are relevant for understanding responsible investment in the Moldovan context. Second, it highlights the indirect channels through which European sustainability requirements may influence Moldovan enterprises, especially through finance, reporting expectations and value-chain relationships. Third, it places financial materiality at the center of the discussion, emphasizing that ESG becomes strategically important when it affects enterprise value, costs, risks, cash flows, access to capital and market opportunities. In this way, the article contributes to a more contextualized understanding of responsible investment in the Republic of Moldova, where ESG is still emerging as a financial, institutional and strategic concern.

## 2. MATERIALS AND METHODS

The study is designed as an exploratory and comparative research, combining qualitative documentary analysis with descriptive interpretation of selected secondary indicators. This methodological approach is appropriate for the research objective, since responsible investment and ESG integration in the Republic of Moldova are still at an emerging stage, while official data on sustainable finance, ESG reporting and green financial instruments remain limited. For this reason, the article does not aim to develop an econometric model, but rather to examine how ESG frameworks acquire financial materiality in a transitioning economy and how European experience may inform the development of responsible investment in Moldova.

The research is based on academic literature, international and European ESG frameworks, policy documents and statistical data relevant to the European Union, Romania and the Republic of Moldova. The academic literature was used to define the conceptual relationship between ESG, SRI, responsible investment, financial performance and risk management. International and European frameworks, including the Corporate Sustainability Reporting Directive, the European Sustainability Reporting Standards, the IFRS Sustainability Disclosure Standards, the GRI Standards, the EU Taxonomy, the Principles for Responsible Investment and the Equator Principles, were examined in order to identify how sustainability requirements are translated into disclosure practices, risk assessment and investment decision-making.

The methodological framework integrates several complementary methods. Literature-based conceptual analysis was applied to clarify the transition of ESG from ethical screening and corporate responsibility toward a component of responsible investment and financial analysis. Documentary analysis was used to examine the relevance of ESG and sustainable finance frameworks for the Moldovan context, with attention to their possible indirect influence through banks, investors, reporting expectations, export relations, value chains and cooperation with international financial institutions. Comparative analysis was applied to assess the different stages of responsible investment development in Romania and the Republic of Moldova. Romania was selected as a reference case because, as an EU member state, it has already advanced in the implementation of sustainable finance

instruments, including green bonds, green loans, ESG reporting and climate risk monitoring in the banking sector. Moldova was analyzed as a country where responsible investment is still mainly associated with institutional formation, financial-sector modernization, energy security, donor support and gradual alignment with European requirements.

The empirical dimension of the study relies on descriptive statistical analysis of selected indicators related to green bond issuance, renewable energy, climate-related economic losses, research and development expenditure, resource consumption and circular material use. These indicators were used to capture general trends, cross-country differences and the position of responsible investment instruments within the broader process of green transformation. The descriptive approach was selected because it allows the identification of relevant patterns and policy implications in a context where data availability remains insufficient for more advanced quantitative modeling.

Financial materiality represents the central analytical criterion of the study. ESG factors were interpreted as financially material when they could influence enterprise value, production costs, operating margins, cash flows, access to credit, investment attractiveness, risk exposure, export capacity or long-term competitiveness. This perspective is particularly relevant for Moldovan manufacturing enterprises, where sustainability-related issues may become financially significant through energy efficiency, resource consumption, technological modernization, governance quality, labor conditions, supplier requirements and access to European markets.

The research process involved the conceptual clarification of ESG and responsible investment, the examination of international and European ESG frameworks, the comparison of Romania and Moldova as countries at different stages of sustainable finance development, and the interpretation of selected EU indicators from the perspective of financial materiality. This structure made it possible to connect the theoretical, institutional and empirical dimensions of the study and to assess responsible investment not as an abstract sustainability concept, but as a potential factor of financial resilience, market access and enterprise competitiveness.

### 3. RESULTS

The results of the study show that responsible investment has undergone a significant conceptual and practical transformation. The literature indicates a gradual movement from ESG frameworks used mainly as instruments of ethical screening toward more integrated approaches, in which environmental, social and governance factors are incorporated into risk assessment, return analysis, corporate valuation and portfolio decision-making. This evolution reflects a broader shift in finance: investment decisions are no longer assessed only through the logic of financial return, but increasingly through their capacity to account for long-term risks, sustainability-related opportunities and the wider social and environmental implications of economic activity.

ESG has developed from the broader paradigm of corporate social responsibility, but it has gradually acquired a more explicit financial and investment-oriented meaning. While traditional CSR approaches were mainly concerned with the external impact of companies on society and the environment, ESG places stronger emphasis on the way environmental, social and governance factors may influence enterprise risk, financial performance and investment returns (MacNeil & Esser, 2022). This distinction is important because it shows that ESG is not limited to reputational concerns or ethical positioning. Rather, it increasingly functions as a framework through which investors, banks and enterprises can interpret financially relevant risks and opportunities.

Responsible investment/SRI and ESG share a common orientation toward sustainable development, ethical alignment, reduction of negative externalities and the inclusion of non-financial criteria in decision-making. Both approaches extend investment analysis beyond conventional financial indicators and emphasize the importance of environmental, social and governance factors for long-term performance and risk exposure (Szewczuk & Więcek-Janka, 2024; Yunus & Nanda, 2024). At the same time, ESG integration may also respond to investor preferences. Studies suggest that ESG criteria can contribute not only to the optimization of risk-adjusted returns, but also to a stronger alignment between investment strategies and the values of investors (Pedersen et al., 2019).

Therefore, ESG integration combines two dimensions: financial materiality and value-based investment orientation.

The findings also show that ESG has become increasingly relevant for conventional investment managers. Many of them no longer treat ESG as a separate ethical investment category, but incorporate it into fundamental analysis. In this context, ESG factors are used to assess the sustainability, quality and resilience of companies, as well as to identify potential warning signals related to environmental exposure, weak governance, social controversies or reputational vulnerabilities. Thus, ESG has become a useful instrument for strengthening the process of investment risk management (van Duuren et al., 2016).

However, the practical implementation of ESG remains uneven. The application of ESG principles differs considerably across funds, depending on investment philosophy, analytical methodology, internal capacity and the level of commitment demonstrated by asset managers. Some funds move toward a systematic integration of ESG criteria across all stages of the investment process, from screening and valuation to monitoring and engagement. Others apply ESG criteria only selectively, as a complementary analytical tool or as a formal element of investment communication. This diversity of practices confirms that ESG integration is not a uniform process. It depends on how fund managers understand the relevance of environmental, social and governance factors for financial performance, risk management and long-term investment outcomes (Sciarelli et al., 2021).

Compared with the European Union, the Republic of Moldova is at an earlier stage of ESG institutionalization. The Moldovan case differs from the experience of developed ESG markets, where ESG integration is often analyzed through portfolio performance, ESG ratings, capital-market reactions and the behavior of institutional investors. In Moldova, the issue is more closely connected with bank financing, enterprise modernization, export competitiveness, institutional capacity and gradual alignment with European economic rules. Consequently, the financial relevance of responsible investment should be assessed not only through profitability indicators, but also through access to finance, risk reduction, transparency, governance quality and long-term resilience.

This comparison suggests that Moldova should not mechanically reproduce ESG practices from larger and more mature economies. ESG integration should be adapted to the specific structure of the national economy, the limited availability of reliable data, the dominance of small and medium-sized enterprises, the central role of banks in enterprise financing and the challenges faced by the manufacturing sector. A realistic ESG strategy for Moldovan enterprises should begin with practical and measurable actions, such as energy audits, resource-efficiency projects, improved financial and non-financial reporting, stronger internal controls, supplier assessment, occupational safety measures and gradual alignment with recognized disclosure frameworks.

The analysis indicates that responsible investment in Moldova should be understood as a developing financial and institutional mechanism, rather than as an already mature investment model. Its relevance is not limited to ethical considerations, corporate image or formal sustainability declarations. Under current economic conditions, responsible investment may become a tool for improving the quality of enterprise management, reducing financial and non-financial risks, increasing transparency and supporting adaptation to European market expectations. Nevertheless, the relationship between responsible investment and financial performance should be interpreted with caution. ESG-oriented investment may support profitability, access to capital, investment attractiveness and cash-flow stability only when it is based on reliable data, managerial competence, institutional incentives and real operational changes. If ESG is reduced to a formal reporting exercise, its financial effect will remain limited and may even generate additional administrative costs without creating substantial value. This cautious interpretation is consistent with the broader academic literature, which generally supports a positive or non-negative relationship between ESG and corporate financial performance, while also emphasizing differences across firms, sectors, time horizons and implementation quality (Friede et al., 2015; Whelan et al., 2021).

For Moldovan manufacturing enterprises, the most realistic short- and medium-term benefits of responsible investment are likely to arise from energy efficiency, improved governance, better risk management, stronger transparency and enhanced export readiness. These areas are directly

connected with the financial resilience and competitiveness of industrial firms. Therefore, the implementation of ESG principles should be linked with enterprise-level financial planning, investment appraisal, cost management and strategic decision-making. In this sense, ESG becomes financially material when it influences production costs, access to external markets, credit conditions, operational risks and the capacity of enterprises to adapt to European requirements.

A useful reference point for Moldova is the recent experience of Romania. Over the past five years, responsible investment in Romania has moved from a largely declarative ESG agenda toward a more institutionalized system of sustainable finance. In this study, responsible investment is understood as investment and financial decision-making in which environmental, social and governance factors are considered alongside profitability, risk and liquidity. In Romania, this process has been accelerated by EU membership, the application of European sustainability reporting regulation, the development of the green bond market, the expansion of green banking products and the country's participation in green transition financing programs.

Unlike Romania, the Republic of Moldova is still at an earlier stage in the formation of its responsible investment system. While Romania has already developed measurable financial instruments, including green bonds, green loans, corporate ESG reporting and climate risk monitoring in the banking sector, Moldova's main achievements during 2023–2025 have been mainly institutional in nature. These include the accession of the National Bank of Moldova to the Sustainable Banking and Finance Network, the approval of the Sustainable Finance Roadmap for 2024–2028, the establishment of a national sustainable finance working group and the promotion of ESG approaches for small and medium-sized enterprises (*Power BI Report, 2025*).

Romania and the Republic of Moldova are therefore positioned at different stages in the development of responsible investment. Romania has already moved toward the practical implementation of sustainable finance instruments, including sovereign green bonds, green bank loans, corporate ESG reporting, climate monitoring in the banking sector and the use of EU funds for the green transition. Moldova, by contrast, is still building the institutional foundations of responsible investment through the sustainable finance roadmap, working groups, ESG approaches for SMEs, energy regulation and cooperation with international organizations. These differences are summarized in Table 1.

**Table no.1. Romania and the Republic of Moldova: stages and instruments of responsible investment development, 2023–2024**

| Criterion            | Romania                                                    | Republic of Moldova                                                     |
|----------------------|------------------------------------------------------------|-------------------------------------------------------------------------|
| Stage of development | Practical implementation of instruments                    | Formation of institutional foundations                                  |
| Green bonds          | Seven issuances worth EUR 8.1 billion in 2024              | A comparable market has not yet been formed                             |
| Green loans          | RON 5.7 billion in corporate green loans by September 2024 | Comparable regular official statistics are not yet available            |
| ESG reporting        | Developing under the influence of CSRD and EU practices    | At the stage of preparation and adaptation, especially for SMEs         |
| Renewable energy     | 25.8% in 2023; target of 38.3% by 2030                     | 20.8% in 2024; target of 27% by 2030                                    |
| Main driver          | EU regulation, capital market, banks, green bonds          | National Bank of Moldova, energy security, donors, European integration |
| Main limitation      | Slow absorption of funds and implementation of reforms     | Lack of mature financial instruments and data                           |

Source: elaborated by author on data from National Bank of Romania (2024); Ministry of Finance of Romania (2025); World Bank Treasury (2025); European Environment Agency (2025); Government of Romania (2024); Ministry of Energy of the Republic of Moldova (2024); National Bank of Moldova (2024); Sustainable Banking and Finance Network (2024).

The comparison highlights an essential distinction. In Romania, responsible investment has already become part of the financial market, whereas in Moldova it is still mainly part of development policy and the future architecture of the financial system. Romania benefits from its status as an EU member state, which gives it direct access to European funds, places it under European regulatory requirements and enables it to attract international investors through green bonds and other

sustainable finance instruments. Moldova is influenced by the EU more indirectly, through the European integration process, donor requirements, cooperation with international financial institutions, energy security concerns and export relations.

At the same time, Romania's experience offers an important lesson for Moldova: the availability of financial resources does not automatically ensure a rapid and effective green transition. The example of the National Recovery and Resilience Plan shows that even when substantial funding is available, implementation may be constrained by limited administrative capacity, delayed reforms and insufficient project preparation. This lesson is particularly relevant for Moldova, because sustainable finance requires not only strategies and roadmaps, but also the practical capacity of enterprises, banks and public institutions to collect data, assess ESG risks, prepare investment projects and monitor measurable results.

Romania's progress over the last five years suggests that responsible investment develops more effectively when three conditions are present at the same time: a regulatory framework, financial instruments and measurable indicators. Romania has advanced in this direction by creating a sovereign green bond instrument, expanding green banking, strengthening climate risk monitoring in the financial sector and integrating the ESG agenda into European reporting and financing mechanisms. For Moldova, a realistic strategy should not consist in directly copying the Romanian model, but in gradually adapting selected elements to domestic institutional and economic conditions. In the first stage, Moldova needs national definitions of green and sustainable financial products, a statistical system for recording green loans, ESG indicators for enterprises, a methodology for assessing climate risks in the banking sector and pilot programs for manufacturing enterprises. In the second stage, the issuance of sovereign or municipal green bonds may be considered, especially for projects related to energy efficiency, water infrastructure, renewable energy and industrial modernization.

The comparison also shows that, for Romania, responsible investment is already an instrument for attracting capital and strengthening the financial market. For Moldova, it remains primarily an instrument of institutional modernization, energy resilience and preparation of enterprises for European requirements. In this sense, Moldova is at an earlier stage, but Romania's experience can serve as a practical reference. The first steps for Moldova should not be limited to formal ESG declarations. They should focus on measurable areas such as energy efficiency, transparent reporting, climate risk management, green lending and improved investment readiness of enterprises.

Over the past five years, Romania has achieved visible progress in responsible investment by issuing large sovereign green bonds, expanding the green loan market, strengthening the ESG infrastructure of the financial sector, reducing greenhouse gas emissions compared with the 1990 level and integrating sustainable finance into the European regulatory system. Nevertheless, challenges remain, including the slow absorption of NRRP funds, the still limited share of green loans in the total corporate loan portfolio and the need to accelerate the energy transition. Moldova, in turn, has so far demonstrated institutional rather than financial results, including the approval of the Sustainable Finance Roadmap, participation in international sustainable finance networks, development of energy regulation, promotion of ESG for SMEs and improvement of the energy efficiency of the economy. Therefore, the key conclusion is that Romania is already at the stage of market application of responsible investment, while Moldova is still at the stage of creating the conditions for its future development. For Moldovan manufacturing enterprises, Romania's experience is particularly valuable because it shows that ESG approaches are becoming not only a matter of reputation, but also a factor of access to capital, export adaptability, energy efficiency and long-term competitiveness.

Figure no. 1 presents selected responsible investment indicators in the European Union, showing both the level reached in 2023 and the changes registered since 2018. The results indicate measurable progress in climate and green transformation across the European Union. However, they also reveal persistent challenges related to financing, energy vulnerability and the still limited development of the circular economy. The decarbonization index of 64.5 reflects substantial improvement compared with the 1990 level. At the same time, annual economic losses of EUR 20.1

billion attributed to climate-related challenges suggest that climate risks continue to accumulate and may advance faster than mitigation efforts. This points to the need for a stronger financial system capable of supporting adaptation, resilience and long-term climate-related investments.

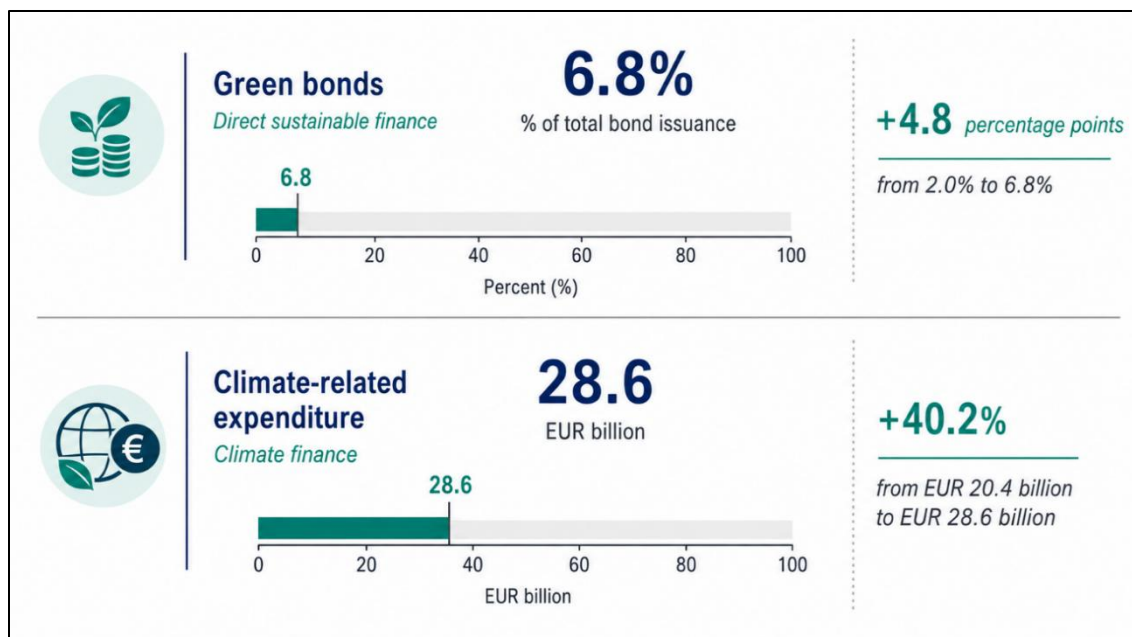


**Figure no. 1. Responsible investment indicators in the European Union: levels in 2023 and changes since 2018**

Source: elaborated by authors based on data from (Eurostat (European Commission), 2025)

The data also show that sustainable finance instruments remain insufficiently developed in relation to the scale of the transition. Green bonds account for only 6.8% of total bond issuance, while public expenditure of EUR 28.6 billion, although significant in absolute terms, remains below the volume of capital required for substantial progress toward carbon neutrality. This indicates that responsible investment instruments are growing, but they still occupy a relatively limited position within the broader financial system.

The energy sector illustrates the complexity of this transition. On the one hand, the EU has achieved visible progress, with 24.6% of energy coming from renewable sources. This confirms that the green transition is advancing and that renewable energy has become an important component of the European energy mix. On the other hand, the EU remains highly dependent on energy imports, with an import dependency rate of 58.3%. This means that, despite progress in renewables, the energy system remains structurally vulnerable to external shocks, price volatility and geopolitical risks.

The social dimension of the transition is visible in the area of household energy affordability. Approximately 10.6% of the population is unable to adequately heat their homes. This indicator shows that the green transition does not affect all social groups equally. Its consequences are distributed differently depending on income level, housing conditions and access to affordable energy. Therefore, responsible investment should not be understood only as a financial or environmental issue, but also as a social challenge that requires attention to inclusion, affordability and just transition mechanisms.

The EU also has significant innovation potential, although current levels remain insufficient for deep industrial renewal. Research and development expenditure stands at 2.24% of GDP, while new passenger cars still emit an average of 107.6 g CO<sub>2</sub>/km. These indicators suggest that stronger technological transformation is still needed, especially in industry and transport. Innovation remains one of the key conditions for transforming responsible investment from a reporting and financing agenda into a real driver of productivity, competitiveness and emissions reduction.

The weakest area reflected by the data is the circular economy. Only 11.8% of materials are recycled, while total resource consumption reaches 6.4 billion tonnes. These figures indicate that the

traditional linear model of extraction, production, consumption and disposal continues to dominate. The transition toward reuse, recycling and more responsible resource management remains insufficient. The EU data for 2022–2024 suggest that the green transition can become truly sustainable only through the coordinated development of several interconnected pillars: sustainable finance, energy independence, innovation and circular economy. If these elements continue to advance at different speeds and remain insufficiently integrated, the transition toward a green economy will remain costly, uneven and exposed to structural risks.

Figure no. 2 illustrates the dynamics of green issuance by type of issuer in the EU-27 during the period 2014–2024.

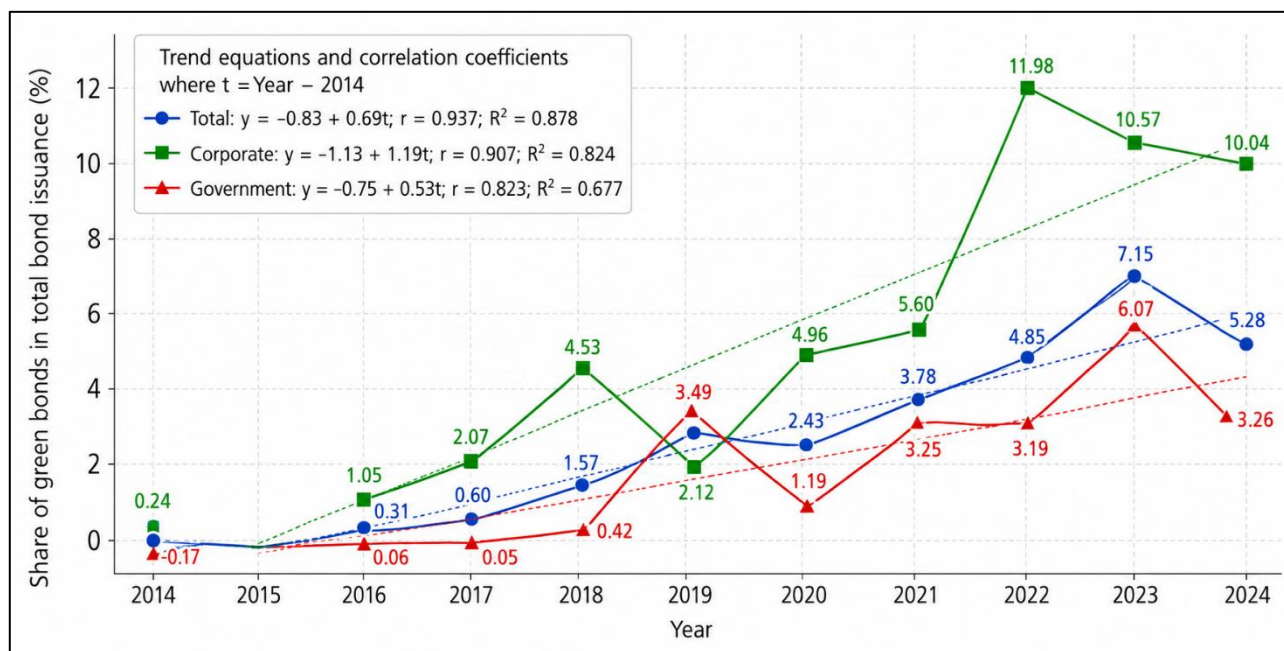


**Figure no.2. Dynamics of green issuance by type of issuer in the EU-27, 2014-2024**

Source: elaborated by authors based on data from <https://ec.europa.eu/eurostat/data/database>

The evolution of green issuance in the EU-27 shows a clear expansion of the green bond market over the last decade. In 2014, green bonds were almost absent from the EU debt market, representing only 0.07% of total issuance. By 2024, their share had increased to 6.94%. This development demonstrates significant progress, but it also reveals the limits of the transformation. Even after ten years of growth, green bonds still represent less than 7% of total bond issuance in the EU. In other words, most of the bond market continues to operate outside a sustainable finance logic.

A notable feature of the data is the difference between corporate and government issuers. Companies moved more rapidly and more consistently than governments during the analyzed period. By 2024, the corporate green bond share had reached 12.75%, showing a substantial increase compared with 2014. This suggests that companies have been motivated by practical factors such as investor expectations, regulatory pressure, access to sustainable finance and the need to demonstrate ESG credibility to partners and clients.

Government issuers followed a less stable trajectory. Their participation increased, declined and then recovered at different stages, reflecting the influence of budgetary conditions, political priorities and exceptional events such as the pandemic. The government green bond share reached 3.49% in 2019, declined to 1.19% in 2020, increased again to 6.07% in 2023 and then decreased to 4.21% in 2024. This pattern suggests that public-sector green issuance has not yet achieved the same level of continuity and predictability as corporate issuance. This is important because sustainable finance requires long-term policy consistency, credible project pipelines and stable institutional commitment.

The slight decrease in the total green bond share from 7.15% in 2023 to 6.94% in 2024 should not be interpreted as a crisis, but it is still relevant. It may indicate market maturation, stronger

competition for eligible green assets and a higher compliance burden associated with verification and reporting standards. The credibility of green bonds depends on the quality of underlying projects, transparency of use of proceeds and confidence in verification mechanisms. Maintaining this credibility requires institutional effort and generates additional costs.

For Moldova, which is still building the foundations of a green finance system, the EU experience provides a practical lesson. A green bond market can grow significantly even from a very low starting point. However, its long-term credibility depends on the interaction of three elements: clear and stable rules, reliable verification and genuine commitment from both public and private actors. Without these conditions, the growth of green finance may remain fragile and vulnerable to formalism.

Figure no. 3 presents the share of green bonds in total bond issuance by EU country in 2023.

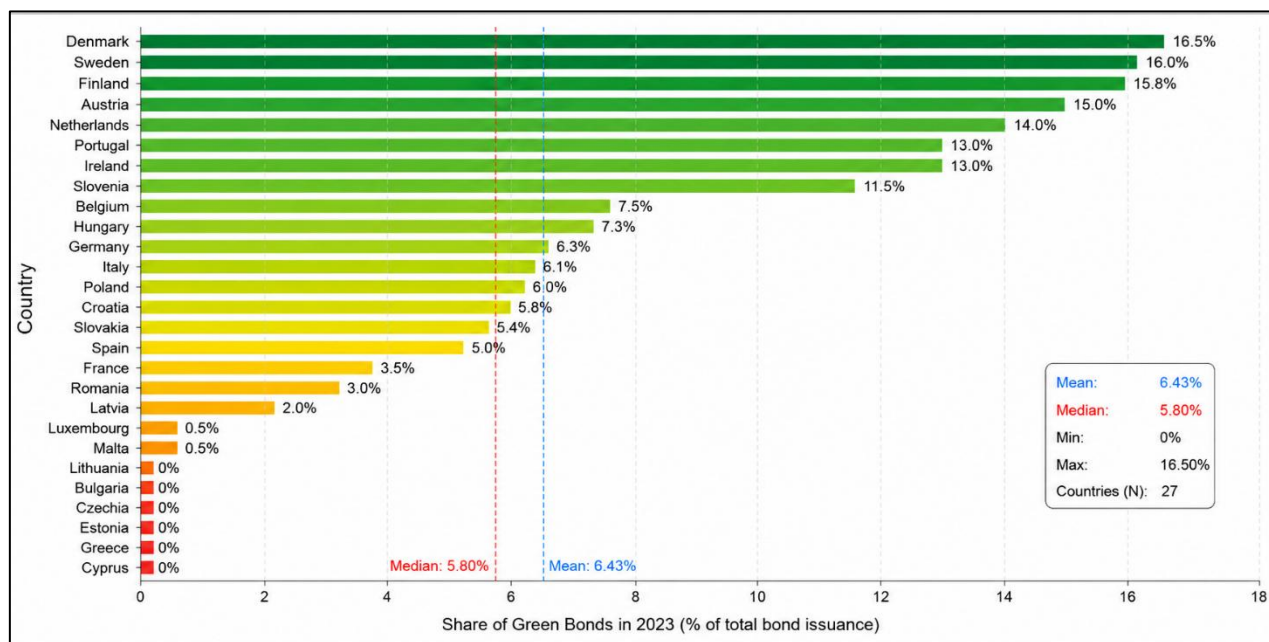


**Figure no. 3. Share of green bonds in 2023 as a percent of total bond issuance by country**

Source: elaborated by authors based on data from <https://ec.europa.eu/eurostat/data/database>

The country-level comparison reveals significant differences in the use of green bonds across EU member states. Although EU countries operate within a common regulatory and sustainable finance framework, the practical application of green bond instruments varies considerably. Some countries have integrated green bonds into regular financing practices, while others remain only marginally involved in this market.

Denmark records the highest share, with approximately 16.5% of total bond issuance classified as green. Sweden, Finland and Austria also report high levels. In these countries, green bonds are no longer exceptional instruments, but have become part of the regular financing practices of governments and companies. At the opposite end, several countries report results close to zero, including Bulgaria, Czechia, Estonia, Greece, Cyprus and Lithuania, with Malta and Luxembourg also showing very limited participation. This means that a significant number of EU member states remain weakly represented in the green bond market.

This differentiation is particularly relevant for Moldova because many of the countries with low green bond activity are located in Central and Eastern Europe or in smaller financial markets. Their experience may be more comparable to Moldova than that of the largest and most advanced EU economies. The data suggest that the existence of a European regulatory framework does not automatically lead to active green bond issuance. National strategies, institutional capacity, investor demand and political commitment remain decisive.

The results also show that the size of the financial market does not automatically determine leadership in green bond issuance. Germany, despite having the largest bond market in the euro area,

recorded a green bond share of 6.3% in 2023. France, which has played an important role in the development of sovereign green bonds in Europe, reported a share of 3.5% in the same year. By contrast, Portugal, with a smaller economy, reached 13.0%, while Slovenia achieved 11.5%. This suggests that green bond development depends not only on economic size, but also on the existence of a clear issuance strategy, investor demand and consistent political support.

For Moldova, this finding is important. A country does not need to have a large financial market in order to begin developing green finance. What is more important is the existence of appropriate institutions, a credible strategy and the capacity to implement it consistently. The experience of smaller EU economies shows that green finance development is possible when government policy, financial-sector capacity and market demand are aligned.

Figure no. 4 analyzes the relationship between GDP per capita and the share of green bonds in total bond issuance across selected EU countries in 2023.

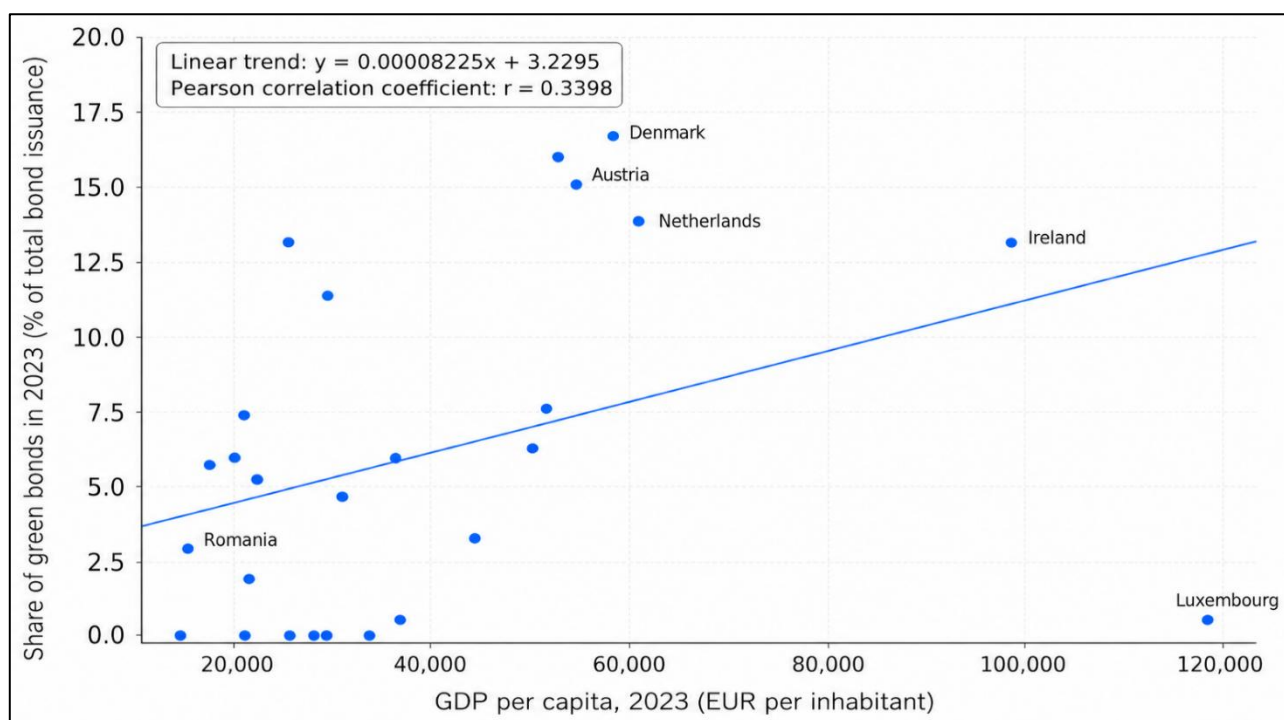


**Figure no. 4. Relationship between GDP per capita and the share of green bonds in total bond issuance across selected EU countries, 2023**

Source: elaborated by authors based on data from <https://ec.europa.eu/eurostat/data/database>

At first glance, the relationship suggests that wealthier countries tend to issue a higher share of green bonds. Countries such as Denmark, Sweden, Finland, Austria and the Netherlands combine relatively high GDP per capita with high green bond shares. This relationship is understandable, as higher-income economies usually have more developed financial systems, stronger institutional capacity, more experienced investors and greater demand for sustainable financial instruments.

However, the data also show important exceptions. Luxembourg has the highest GDP per capita in the EU, at approximately EUR 118,800, but its green bond share is only about 0.5%. This reflects the specific structure of its financial system, which is oriented more toward investment fund listing and asset management than toward large volumes of primary debt issuance. As a result, a high GDP per capita does not automatically translate into high green bond activity.

Ireland represents another special case. Its GDP per capita is very high, at approximately EUR 95,300, but this indicator is strongly influenced by the activity and profits of multinational companies registered in the country. Despite this statistical distortion, Ireland's green bond share of 13.0% reflects real institutional demand and active participation from both government and corporate issuers. Therefore, the Irish case shows that green bond development depends not only on income level, but also on institutional demand and issuer activity.

France also illustrates the limits of a simple relationship between income and green bond activity. With a GDP per capita of approximately EUR 40,800 and a long-standing role in European climate policy, France might be expected to rank among the leaders. However, its green bond share in 2023 was only 3.5%. This result is largely influenced by the timing of issuance, since France tends to issue green bonds in large batches rather than evenly across years. Therefore, the 2023 result reflects the issuance calendar more than the overall strength of the French green bond market.

Portugal is one of the most relevant examples for Moldova. Although its GDP per capita is approximately EUR 25,700, one of the lower levels in Western Europe, its green bond share reached 13.0%. This performance was supported by a clear policy decision to prioritize green sovereign issuance and by active participation of the corporate energy sector, especially in renewable energy. Portugal demonstrates that countries with more modest income levels can still develop visible green finance instruments when policy priorities, sectoral opportunities and investor demand are aligned.

For Moldova, this result is encouraging. The development of green finance does not have to wait until the country reaches the income level of the most advanced EU economies. More important are a clear government strategy, consistent issuance policy, credible regulatory conditions and institutional capacity. The examples of Portugal and Slovenia show that smaller or less wealthy economies can still build relevant green finance instruments if they create the appropriate conditions. For Moldova, the priority should therefore be the gradual development of a national sustainable finance architecture, starting from reliable data, transparent reporting, pilot green lending instruments and projects with clear environmental and financial benefits.

#### 4. CONCLUSIONS

The findings of the study confirm that the transition from ESG frameworks to responsible investment reflects a broader transformation in contemporary finance. ESG is no longer limited to ethical screening, reputational positioning or voluntary corporate responsibility. It increasingly functions as an analytical framework through which investors, banks, enterprises and regulators assess risks, opportunities and long-term value creation. From this perspective, responsible investment expands financial decision-making by integrating environmental, social and governance factors that may influence enterprise performance, risk exposure, access to capital and strategic resilience.

For the Republic of Moldova, this transformation is particularly relevant because ESG integration is still at an early stage and cannot yet be described as a mature investment model. Responsible investment in Moldova is currently developing mainly as an institutional and financial-sector agenda rather than as a fully operational market practice. The approval of the Sustainable Finance Roadmap, cooperation with international sustainable finance networks, the promotion of ESG approaches for SMEs and the gradual alignment with European requirements indicate that the foundations of responsible investment are being formed. However, the limited availability of green financial instruments, systematic ESG statistics and advanced reporting practices shows that the process remains incipient.

The European experience demonstrates that ESG frameworks may influence Moldovan enterprises even when they are not directly subject to all European regulatory requirements. Instruments such as CSRD, ESRS, IFRS Sustainability Disclosure Standards, GRI Standards and the EU Taxonomy create expectations that extend beyond the EU through banks, investors, export partners, international financial institutions and value chains. Therefore, ESG reporting should not be understood only as a compliance requirement, but also as a condition for competitiveness, investment readiness and long-term business continuity.

The comparison with Romania highlights the difference between a country where responsible investment has already reached the stage of practical market implementation and a country where the institutional architecture is still being developed. Romania has advanced through sovereign green bonds, green loans, ESG reporting, climate risk monitoring and access to European transition financing. Moldova, by contrast, has mainly achieved institutional progress through policy documents, working groups, cooperation mechanisms and early sustainable finance initiatives. This

comparison suggests that Moldova should not mechanically reproduce the Romanian model, but should adapt relevant elements to its own economic structure, institutional capacity and financial-market conditions.

The analysis of EU green finance indicators also shows that a common regulatory framework does not automatically generate uniform progress. Green bonds have expanded significantly in the European Union, but they still represent a limited share of the total bond market, while their development differs substantially across countries. These differences depend not only on income level or market size, but also on institutional capacity, political commitment, investor demand and the availability of credible green projects. For Moldova, this finding is important because it shows that progress in responsible investment can begin through gradual, measurable steps, even before the formation of a fully mature financial market.

Financial materiality remains central for understanding the practical relevance of ESG in Moldova. ESG factors become strategically important when they affect production costs, operating margins, cash flows, access to credit, investment attractiveness, export capacity, risk exposure and long-term competitiveness. For Moldovan manufacturing enterprises, the most immediate areas of financial materiality are likely to be energy efficiency, resource consumption, technological modernization, occupational safety, governance quality, supplier requirements and access to European markets. These areas connect sustainability directly with financial performance and operational resilience.

The study also supports a cautious interpretation of the relationship between ESG and financial performance. Responsible investment does not automatically generate higher profitability. Its financial effects depend on the quality of implementation, reliable data, managerial capacity, institutional incentives and the integration of ESG practices into real operational and strategic decisions. If ESG remains only a formal declaration or a superficial reporting exercise, it may increase administrative costs without creating substantial value. By contrast, when ESG is connected with cost reduction, risk mitigation, modernization, transparency and market access, it can become a source of financial resilience and competitive advantage. From a policy and managerial perspective, Moldova should prioritize realistic and measurable actions: national definitions for green and sustainable financial products, official statistics on green loans and ESG-related financing, integration of climate and ESG risks into banking-sector assessment, pilot projects for manufacturing enterprises and gradual improvement of non-financial reporting practices. For enterprises, the priority should be the identification of ESG factors with direct financial relevance, especially those related to energy costs, resource efficiency, technological renewal, governance quality and export requirements.

### Acknowledgments:

*This research was carried out at the Technical University of Moldova within the framework of the research subprogram 020408, "Research on ensuring sustainable development and increasing the competitiveness of the Republic of Moldova in the European context".*

### REFERENCES

1. Chițimiea, A., Minciu, M., Manta, A.-M., Ciocoiu, C. N., & Veith, C. (2021). The Drivers of Green Investment: A Bibliometric and Systematic Review. *Sustainability*, 13(6), 3507. <https://doi.org/10.3390/su13063507>
2. *EU taxonomy for sustainable activities—Finance—European Commission*. (2026). [https://finance.ec.europa.eu/sustainable-finance/tools-and-standards/eu-taxonomy-sustainable-activities\\_en](https://finance.ec.europa.eu/sustainable-finance/tools-and-standards/eu-taxonomy-sustainable-activities_en)
3. *European Green Deal*. (2025). Consilium. <https://www.consilium.europa.eu/en/policies/european-green-deal/>
4. Eurostat (European Commission). (2025). *Sustainable development in the European Union: Monitoring report on progress towards the SDGs in an EU context : 2025 edition*. Publications Office of the European Union. <https://data.europa.eu/doi/10.2785/1111373>

5. Friede, G., Busch, T., & Bassen, A. (2015). ESG and financial performance: Aggregated evidence from more than 2000 empirical studies. *Journal of Sustainable Finance & Investment*, 5(4), 210–233. <https://doi.org/10.1080/20430795.2015.1118917>
6. *Global progress report*. (2025). [Sustainable banking and finance network. International Finance Corporation]. [https://www.sbfnetwork.org/sites/default/files/2025/Oct/Global-Progress-Report\\_2025\\_Final.pdf](https://www.sbfnetwork.org/sites/default/files/2025/Oct/Global-Progress-Report_2025_Final.pdf)
7. *GRI - Standards*. (2021). <https://www.globalreporting.org/standards/>
8. *IFRS - IFRS Sustainability Standards Navigator*. (2025). <https://www.ifrs.org/issued-standards/ifrs-sustainability-standards-navigator/>
9. MacNeil, I., & Esser, I. (2022). From a Financial to an Entity Model of ESG. *European Business Organization Law Review*, 23(1), 9–45. <https://doi.org/10.1007/s40804-021-00234-y>
10. Pedersen, L. H., Fitzgibbons, S., & Pomorski, L. (2019). *Responsible Investing: The ESG-Efficient Frontier* (SSRN Scholarly Paper No. 3466417). Social Science Research Network. <https://doi.org/10.2139/ssrn.3466417>
11. *Power BI Report*. (2025). <https://app.powerbi.com/view?r=eyJrIjojYjNjMGEwNjctZDVhNS00OTZmLTgwZGMtMzdkYTlhOTRIYTklIiwidCI6ImVmN2E2YTFlmLTUwMjItNDlmOS1iNjA0LTlzMUwNDI5YTE5MSIsImMiOjI9&pageName=a8d9e61d899ced32651b>
12. *Press release on the approval of the Sustainable Finance Roadmap | National Bank of Moldova*. (2024). [https://www.bnm.md/en/content/press-release-approval-sustainable-finance-roadmap?utm\\_source=chatgpt.com](https://www.bnm.md/en/content/press-release-approval-sustainable-finance-roadmap?utm_source=chatgpt.com)
13. Sciarrelli, M., Cosimato, S., Landi, G., & Iandolo, F. (2021). Socially responsible investment strategies for the transition towards sustainable development: The importance of integrating and communicating ESG. *The TQM Journal*, 33(7), 39–56. <https://doi.org/10.1108/TQM-08-2020-0180>
14. Szewczuk, S., & Więcek-Janka, E. (2024). Exploring Sustainable Investment: In-Depth Analysis of Socially Responsible Investing (SRI) and ESG Strategies. *Annales Universitatis Mariae Curie-Skłodowska, Sectio H – Oeconomia*, 58(3), 103–114. <https://doi.org/10.17951/h.2024.58.3.103-114>
15. *The Equator Principles*. (2020). Equator Principles Association. <https://equator-principles.com/app/uploads/The-Equator-Principles-July-2020.pdf>
16. van Duuren, E., Plantinga, A., & Scholtens, B. (2016). ESG Integration and the Investment Management Process: Fundamental Investing Reinvented. *Journal of Business Ethics*, 138(3), 525–533. <https://doi.org/10.1007/s10551-015-2610-8>
17. Whelan, T., Atz, U., Holt, T. V., & Clark, C. (2021). *ESG AND FINANCIAL PERFORMANCE*: <https://www.tandfonline.com/doi/full/10.1080/20430795.2015.1118917>
18. Yunus, Y. A., & Nanda, S. (2024). Exploring Sustainable Finance: A Qualitative Inquiry into Responsible Investment and ESG Risk Evaluation. *Golden Ratio of Finance Management*, 4(1), 01–13. <https://doi.org/10.52970/grfm.v4i1.429>