CORPORATE SUSTAINIBILITY REPORTING: FROM THEORY TO TO STANDARDS AND THE STRATEGIC HORIZONS OF THE FUTURE

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1. INTRODUCTION

The twenty-first century has thrust the global business world into a crucible of change, forcing it to confront a transformation of historic proportions at the intersection of environmental, social, and economic crises. On one hand, the tangible effects of climate change, and on the other, deepening social inequalities and economic fragilities, signal the dawn of a new era where traditional models of existence, based solely on profit maximization, are no longer sustainable. In this new reality, extreme weather events triggered by the climate crisis cause unforeseeable disruptions in global supply chains, while phenomena such as water scarcity, biodiversity loss, and the rapid depletion of natural resources fundamentally undermine the raw material security of entire industries. The 2021 flood disasters in Europe, for instance, which crippled chip production in the automotive sector and led to billions of dollars in losses, served as a stark illustration of this fragility. In a similar vein, industries such as textiles and agriculture operating in regions with acute water scarcity have been forced to reconsider both their production capacities and long-term strategic frameworks in response to mounting environmental pressures. The consequences of sustainability-related challenges extend beyond short-term operational disruptions, directly jeopardizing a company's legitimacy and reputation. Consequently, sustainability, once viewed narrowly as an environmental metric, has evolved into a critical principle of governance deeply ingrained in the strategic foundation of modern businesses.

The dynamics of reshaping the business world are not limited to environmental factors alone. Human rights violations in global supply chains, rising income inequality, and social polarization have forged a new landscape of legitimacy, where companies are evaluated not only on their financial performance but also on their ethical standing and societal impact. A leading driver accelerating this assessment process is the digital age, which has enabled an era of radical transparency. A controversial executive statement or an ethical transgression within a company's value chain can escalate rapidly, triggering a global backlash that is significantly amplified

by digital media. Consequently, a new business paradigm has emerged: companies are now held accountable not only for the quality of their products and services but also for the ethical and environmental performance of their entire value chain. Shifting societal expectations have expanded the corporate role beyond purely economic functions to include the creation of positive social and environmental values. Fueled by these prospects, businesses are entering a moment of reckoning, one that compels them to question the adequacy of current metrics and fundamentally re-examine their primary goals, their social role, and even their operational DNA. Consequently, the long-standing paradigms of business literature are crumbling, and in their place, a new intellectual structure is being created: one that requires companies to redefine not just their approach to profit, but their very social and environmental charter.

The intellectual groundwork for this ongoing transformation has been shaped by the erosion of a paradigm that held sway in business and finance for over half a century. The doctrine formulated by Nobel laureate economist Milton Friedman, which famously asserted that the sole social responsibility of business is to increase its profits, long served as a foundational reference for neoliberal economic policies (Friedman, 2007). From Friedman's perspective, a company allocating resources to social or environmental issues was an "expenditure" made without shareholder consent and a betrayal of its primary economic purpose. This viewpoint, however, systematically overlooks the environmental and social costs known as “externalities.” For example, while a factory's chemical waste harms ecosystems and public health, carbon emissions threaten the climate, and precarious working conditions undermine social cohesion. These hidden costs accumulate over the long term within corporate value chains, transforming into systemic risks that trigger not only environmental but also economic crises. In effect, costs are “socialized”, tolerated by society and the state, while profits are “privatized.” In the complex tapestry of the twenty-first century, these “externalities” have transcended theoretical abstraction to become tangible risks reflected directly in financial statements. It is at this critical juncture that Stakeholder Theory, developed as an alternative to Friedman’s narrow shareholder-centric view, has

emerged as a new governance model in sustainability discussions. As a testament to how concrete this risk has become, new carbon emission regulations implemented in 2023 subjected companies in energy-intensive sectors, unprepared, to billions of dollars in penalties. These regulations are not merely a practical necessity; they are also an indicator of a theoretical shift, accelerating the transition of businesses toward a stakeholder-oriented approach. This transformation demonstrates that a stakeholder-centric governance model is no longer a theoretical debate but has become a decisive factor in the strategic decision-making processes of businesses.

One of the most important things that is making this change happen and giving it a theoretical basis is Edward Freeman's Stakeholder Theory (Freeman, 1984). His notion reveals that corporations must be accountable to everyone who has a direct or indirect effect on the company's success, such as employees, customers, suppliers, local communities, regulators, and even future generations. This point of view pronounces that a company's long-term success depends on how well it manages its financial capital, its investments in human capital (which helps it keep skilled workers), its social capital (which shows its credibility and trust), and its natural capital (which supports its operations, like clean air and water). Large digital businesses' multibillion-dollar efforts to make sure that human rights standards are followed in their supply chains are now seen as an important way to get ahead of the competition, in addition to being the ethical thing to do. This reveals how keeping moral values is transitioning from being a financial concern to a selling point. A business that doesn't pay its workers enough could lose its finest staff to more responsible competitors and have a high turnover rate. In the same way, a firm that doesn't care about its effect on the environment can face legal action, boycotts from customers, and damage to its brand. The digital age is making things more open, which gives these stakeholders more power and influence. Because of this, it is strategically important to meet their needs. Suchman says that this forces firms to always negotiate for, get, and keep their legitimacy, or “social license to operate”, in the eyes of the public (Suchman, 1995).

The proactive actions of international policymakers and regulatory agencies have been among the most tangible drivers of this theoretical shift. Sustainability reporting and corporate social responsibility were mostly optional for many years. This strategy, however, opened the door for deceptive tactics called "greenwashing", in which businesses mislead the public by portraying their social or environmental performance more favorably than it actually is, thereby destroying any meaningful comparison between reports (Lyon & Maxwell, 2011). In addition to undermining consumer confidence, this practice casts doubt on the consistency of reporting, which raises calls for stricter, or "hard law", regulations from investors and legislators. Due to this demand, sustainability is now a legally binding requirement that is auditable and punishable, going beyond simple statements of good intentions.

Without a doubt, the European Union (EU) is leading this new era. Aiming to make the EU a climate-neutral continent by 2050, the European Green Deal, which was announced in 2019, is positioned as both an innovative economic growth strategy and an environmental policy. One important tool in this strategy is the Corporate Sustainability Reporting Directive (CSRD), which requires about 50,000 EU-based businesses to report on their Environmental, Social, and Governance (ESG) performance using the European Sustainability Reporting Standards (ESRS). The concept of "double materiality" is the most ground-breaking invention brought about by the CSRD. According to this principle, businesses must report on the effects of their operations on the environment and society (an "inside-out" perspective) as well as how sustainability issues impact their own financial performance (an "outside-in" perspective) (Baumüller & Sopp, 2021). For instance, an energy company is required by this principle to report on how rising carbon taxes affect its operational costs and how its emissions affect public health and climate change. The International Sustainability Standards Board (ISSB) standards, which are intended to satisfy the investor-centric requirements of international capital markets, are framed by a completely different logic than Europe's multi-stakeholder vision.

ISSB, established by the International Financia Reporting Standards (IFRS) Foundation, provides another significant framework for comprehensive sustainability disclosures. The ISSB was established with endorsement from the G20 and in response to demands from international capital markets to develop a global baseline of investor-focused sustainability disclosures. The concept of single materiality is the cornerstone of the ISSB's framework. According to this method, a sustainability issue is only considered reportable if it could have a major impact on a company's cash flow, cost of capital, or financial performance. This leads to strategic tension and alignment issues because of the clear difference between the investor-centric viewpoint of global financial markets and the inclusive, impact-oriented approach of the EU. Multinational firms are forced to reconsider their reporting strategies from a legal compliance perspective as well as in terms of the messages they convey to various stakeholder groups since many of them must simultaneously comply with both ESRS and ISSB standards, which makes the process more complicated and expensive. Consequently, businesses face a new operating environment that demands a strategic balancing of stakeholder communication, cost control, and organizational alignment.

The goal of this book is to give readers a comprehensive and logical understanding of how sustainability has become a key component of business strategy and how this shift is redefining success for corporations. This work makes an original contribution by addressing three key gaps in the literature: (1) it is one of the comprehensive studies to analyze the tensions between the European Union’s double materiality approach and the ISSB’s investor-focused standards from a strategic and comparative perspective within the Turkish business context; (2) it integrates historical evolution and theoretical foundations under a single framework, weaving reporting standards, ethical issues, and future trends into a cohesive narrative; and (3) it discusses the impact of international standards on corporate governance, stakeholder relations, and circular economy models, encompassing both practical and policy dimensions. In this respect, this book not only offers a theoretical contribution but also serves as a strategic roadmap for practitioners.

The primary objective of this study is to build a solid bridge between academia and industry by examining the paradigm shift of sustainability in business management from both theoretical and practical dimensions. To this end, the research investigates how businesses can integrate their environmental, social, and economic responsibilities within a comprehensive framework. On the one hand, the book explores fundamental theories like corporate citizenship, legitimacy, agency, and stakeholders to explain why sustainability has emerged as a key concept in contemporary business. On the other hand, it seeks to show how modern reporting standards, materiality analyses, and governance procedures reflect these theoretical frameworks in a tangible way. For instance, the emphasis of Stakeholder Theory on responsibility to all stakeholders finds its practical counterpart in the CSRD's double materiality principle, while the concept of a "social license to operate" from Legitimacy Theory aligns with the ISSB's transparency demands aimed at bolstering investor confidence.

This work serves as a reference and strategic guide for academics, students, corporate executives, investors, and policymakers navigating this complex field. It aims to bridge the gap between academic theory and the practical realities of the corporate world. Structurally, the book is organized into four main parts, framed by an introduction and a conclusion. These parts guide the reader sequentially from the subject's historical foundations, through an analysis of present standards, and ultimately to the strategic horizons of the future. Within this framework, all chapters share a consistent analytical perspective and narrative style, converging on a central point of contention. This format allows readers to follow the book's primary argument while also enabling each chapter to be read as a self-contained analysis.

- **Chapter 2: The Historical Evolution and Theoretical Foundations of Corporate Sustainability**: This chapter reveals the beginnings of corporate sustainability by thoroughly charting its development from the Industrial Revolution's paternalistic methods to the 20th century's social responsibility movements and the multifaceted

concept of sustainability that exists today. This section utilizes fundamental theories, including Stakeholder Theory, Legitimacy Theory, and Corporate Citizenship to analyze the conceptual foundations shaping corporate responses to societal expectations.

- **Chapter 3: The Transforming Nature of Sustainability Reporting and Global Standards**: This chapter traces the evolution of sustainability reporting from a voluntary practice to a legal requirement, examining the key drivers of this transition and major standards such as the Global Reporting Initiative (GRI), ESRS, and IFRS. Furthermore, it evaluates the geopolitical and strategic aspects of the so-called "war of standards", focusing primarily on the conflicts between the international organizations and global financial markets.
- **Chapter 4: The Materiality Paradigm, Reporting Ethics, and the Risk of Greenwashing**: Focusing on the technical and ethical core of reporting, this chapter delves into the European Union's double materiality paradigm and comprehensively discusses the problem of greenwashing: its types, impacts, and the methods developed to combat it.
- **Chapter 5: The Future of Corporate Sustainability: Strategic Horizons and Governance**: This concluding chapter examines the transformative forces shaping future corporate environments. The analysis focuses on several key areas: the role of technologies such as Artificial Intelligence (AI) and Blockchain in reporting; the rise of green finance; the adoption of new business models like the circular economy; and the next-generation governance approaches required to ensure corporate resilience.

As described above, there are four main chapters in the book, and each one builds on the one before it. Figure 1-1 shows how the

ideas in these chapters flow from one to the next. This diagram enables the reader to follow the narrative from theoretical foundations to standards, and from ethical debates to future outlooks, with a holistic perspective.

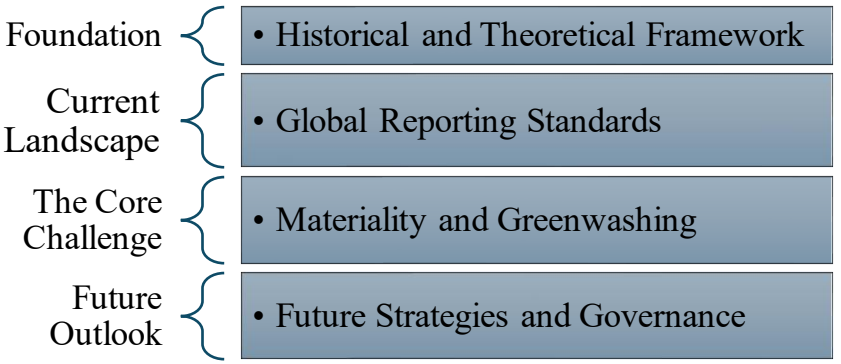


Figure 1-1 The Conceptual Framework and Chapter Flow of the Study

In conclusion, this study aims to offer the reader a comprehensive, critical, and holistic understanding that encompasses the historical evolution of corporate sustainability, contemporary reporting standards, and strategic perspectives on the future. It is now abundantly clear that the successful and sustainable businesses of tomorrow will be those that view the creation of economic, social, and environmental value not as a cost item or a marketing tool, but as the fundamental source of innovation, competitive advantage, and long-term resilience. These companies will decisively prioritize transparency and accountability, viewing stakeholder trust as their ultimate competitive advantage. To understand the implications and mechanics of this critical transformation, this study seeks to provide a comprehensive framework and analyze it in depth from a management perspective. This framework is intended not only to foster theoretical discussion but also to serve as a foundational reference point in both academic literature and applied practice for readers who wish to develop strategic insights into the future of business.

2. THEORETICAL FOUNDATIONS AND HISTORICAL DEVELOPMENT OF CORPORATE SUSTAINABILITY

The global business environment is undergoing a period of significant transformation, driven by intersecting ecological, social, and economic crises. Consequently, macro-level challenges, such as climate change impacts, resource scarcity, and social injustice, have evolved into fundamental risk factors that necessitate integration into corporate strategic planning. In this new reality, businesses are compelled to look beyond financial returns and fundamentally question their purpose and modes of operation. Consequently, the traditional economic view that a business's sole purpose is maximizing shareholder profit, as popularized by Milton Friedman, proves inadequate for addressing the interconnected challenges of the modern era. (Friedman, 1962).

In response to this new operating reality, intensifying stakeholder demands and evolving societal norms are driving businesses to adopt a broader view of their responsibilities. The intersection of environmental, social, and economic struggles in this context has laid the groundwork for the emergence of the ESG framework, which has been developed as a critical tool for evaluating corporate performance on these non-financial factors. To fully appreciate the specific role of ESG, however, it is essential to first distinguish it from foundational concepts such as corporate social responsibility (CSR) and corporate sustainability. While corporate sustainability originates from CSR, it differs from CSR's traditionally voluntary and reputational focus through its fundamental integration into the core business model to create long term value. This distinction provides a critical starting point for understanding the transformation that began with the Brundtland Report and the role of frameworks like the Triple Bottom Line (TBL) and ESG.

Corporate sustainability has therefore evolved into a strategic management paradigm that transcends traditional notions of CSR. The Brundtland Commission, in its 1987 report Our Common Future, first defined the concept on a global scale, formulating it as

“development that meets the needs of the present without compromising the ability of future generations to meet their own needs”. This definition was pivotal, elevating sustainability from pure environmental concern to a holistic paradigm that integrates economic and social dimensions. Following this conceptual evolution, sustainability moved to the center of corporate strategy, driving a shift toward more inclusive, long-term approaches and fundamentally transforming the perception of value creation. (Garriga & Melé, 2004). The integration of social and environmental objectives throughout the entire value chain in long-term value creation strategies has become the distinguishing feature of corporate sustainability.

The TBL principle, popularized by John Elkington in 1998, argues that corporate performance should be evaluated not only on financial profitability (Profit) but also in conjunction with its environmental (Planet) and social (People) dimensions (Elkington, 1998a). This approach shifted the focus of success from a purely financial metric to a multifaceted understanding of a company's environmental and social contributions. Today, this structure has been made measurable through ESG criteria, using indicators such as carbon emissions, water usage, employee rights, and board transparency. The evolution of sustainability is thus marked by its transformation from an abstract principle into a tangible tool for assessing and comparing corporate performance.

The three pillars of this framework provide a critical analytical structure for understanding the multidimensional nature of sustainability. Each dimension encompasses distinct areas of focus, yet it gains its full meaning through its interaction with the others, as it would be incomplete if considered in isolation:

- **Economic Dimension (Profit):** This dimension extends beyond traditional profit-and-loss analysis to include a company's long-term financial resilience, innovation capacity, effective risk management, and ethical governance practices. The core objective is to shift the focus from short-term profit maximization to the creation of stable, long-term value for all stakeholders.

- **Environmental Dimension (Planet):** Encompassing all a business's direct and indirect impacts on the natural environment, this dimension includes key elements such as combating climate change (e.g., reducing carbon emissions), resource efficiency (water and energy use), waste management, pollution prevention, and the protection of biodiversity. This business approach goes beyond simply minimizing a company's social and environmental footprint; it's about actively creating a positive 'handprint'.
- **Social Dimension (People):** This dimension focuses on a company's relationship with all its human stakeholders, from employees and customers to supply chain workers and the local community. Issues such as employee rights, occupational health and safety, diversity and inclusion, fair wage policies, community investment, and customer welfare form the foundation of this dimension.

The interconnected relationship between these three dimensions is often visualized in the literature with a Venn diagram (Figure 2-1). This model illustrates that true sustainability can only be achieved holistically at the precise intersection of all three dimensions. According to the model, the intersection of the economic and social dimensions is defined as “equitable,” the intersection of the economic and environmental dimensions as “viable,” and the intersection of the social and environmental dimensions as “bearable”. These intersecting areas clearly show that sustainability strategies must be built on a multi-dimensional balance, not a single focus. However, it is the narrow intersection at the center where all three areas converge that represents the ideal of "sustainability”. This model emphasizes that sustainability strategies must demonstrate balanced performance across all three domains.

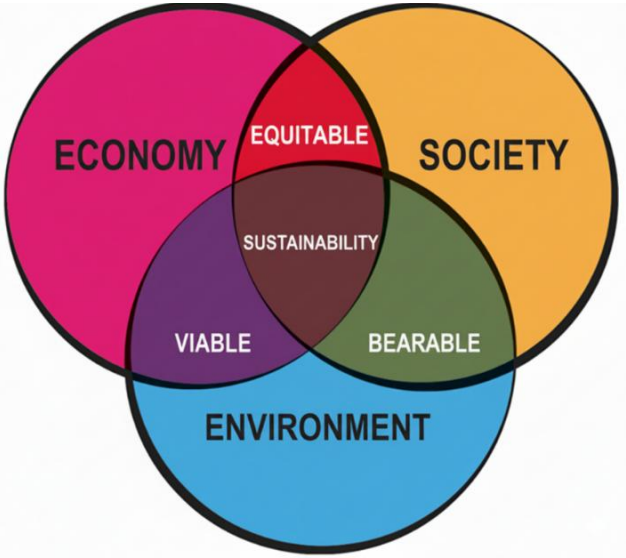


Figure 1-2 The Three Dimensions of Sustainability

The primary reason corporate sustainability has become a critical strategic imperative today is that businesses can no longer operate as closed systems. Consistent with Stakeholder Theory, a company's success is tied to its responsibility to a wide range of stakeholders, including employees, customers, suppliers, and the communities it serves. (Freeman, 1984). Thanks to radical transparency from digitalization and social media, a company's responsibility is now more visible than ever. Stakeholders' voices are amplified, and a company's reputation can be affected in an instant. Failing to meet stakeholder expectations can result in a company losing its social license to operate, eroding its societal legitimacy. (Suchman, 1995). Therefore, sustainability practices have gained strategic importance not only for risk management and the preservation of legitimacy but also for the competitive advantages they offer in areas such as innovation, brand reputation, and attracting talented employees.

The concept's growing importance has been further reinforced by ambitious frameworks developed at a global policy level. The United Nations' (UN) Sustainable Development Goals (SDGs), adopted in 2015, have presented businesses with both

responsibilities and new market opportunities through 17 distinct goals (United Nations, 2015). Similarly, the European Green Deal, announced by the European Commission, has put forth not just an environmental policy but a comprehensive growth strategy that will transform all economic structures, from supply chains to finance, with the vision of making Europe a climate-neutral continent by 2050 (European Commission, 2019a). These policies have transformed sustainability from a voluntary choice into a legal and operational imperative for companies. For instance, the EU Green Deal is reshaping corporate strategy with policies like the carbon border tax and supply chain reporting requirements, which carry significant operational and financial implications for businesses.

These global dynamics create both unique challenges and significant opportunities, especially for developing countries such as Türkiye, which have intensive trade relations with the European Union. The Carbon Border Adjustment Mechanism (CBAM), one of the most critical components of the EU Green Deal, directly affects Türkiye's export-driven sectors such as iron-steel, cement, and aluminum. This mechanism forces Turkish companies to decarbonize their production processes and accelerate their sustainability investments by imposing additional taxes on products manufactured with higher carbon emissions than EU standards. Consequently, alignment with the EU is no longer merely a political choice but has become a precondition for maintaining economic competitiveness. However, the fact that local regulations are not as comprehensive as EU standards and that a corporate sustainability culture has not yet been fully internalized is causing many companies to face capacity and financing problems as they adapt to this rapid transformation. While this situation creates significant compliance pressure for businesses in Türkiye, it also brings with it opportunities to access green financing and gain a competitive advantage in global markets.

Türkiye's position in this process is of strategic importance due to its deep trade integration with the European Union. The CBAM, expected to be fully implemented from 2026, will directly cover the iron-steel, cement, and aluminum sectors, which account for approximately 40% of Türkiye's exports. This situation compels

Turkish companies to strengthen their carbon measurement infrastructure and align their sustainability reporting with EU standards. However, this process is critically challenged by two factors: the limited reporting capacity of small and medium-sized enterprises (SMEs) and a lack of fully harmonized local regulations. On the other hand, the transformation can be financed through significant opportunities offered by EU funds and green financing mechanisms. This picture transforms the case of Türkiye into a multi-layered phenomenon where sustainability reporting encompasses not only environmental but also geopolitical and competitive dimensions.

All these developments show that corporate sustainability has moved beyond being an academic debate or an activist-driven agenda to become a mainstream priority in the world of finance. The rise of investments based on ESG criteria reveals the transformative power that capital markets have over companies. Sustainability performance has evolved from an ethical choice to a critical factor in investment decisions. Investors managing billions of dollars are actively shaping market dynamics by directing capital towards more responsible and sustainable companies. This trend has led to sustainability performance being accepted as a direct indicator of a company's financial health and its potential to attract investment. At the same time, the rapid rise of the concept has brought with it new problem areas, such as operational difficulties in implementing strategies, debates around greenwashing, and inconsistencies in measurement standards.

In conclusion, corporate sustainability has become the fundamental paradigm of the modern business world, shaped by rising stakeholder expectations, the materialization of environmental and social risks, global policy frameworks, and the pressures of financial markets. As the concept's importance rapidly grows among academics, business leaders, and policymakers, understanding its theoretical foundations and historical evolution has become a strategic necessity for designing effective sustainability strategies. This chapter aims to make visible the transformation in the strategic positioning of companies by examining the historical development and conceptual framework of sustainability.

2.1.Historical Development: The Evolution from Responsibility to Sustainability

Corporate sustainability is not a fixed concept that emerged on a specific date, but rather a dynamic phenomenon that has evolved at the intersection of historical conditions, intellectual debates, and societal expectations. The concept of corporate responsibility to society and the environment has evolved significantly over time, largely shaped by major social, economic, and ecological crises. A chronological examination of this evolution provides a clearer picture of the significant stages that have shaped today's multi-dimensional understanding of corporate sustainability. The main phases of this transformation, discussed in detail in this chapter, are presented as a visual summary in Figure 2-2.

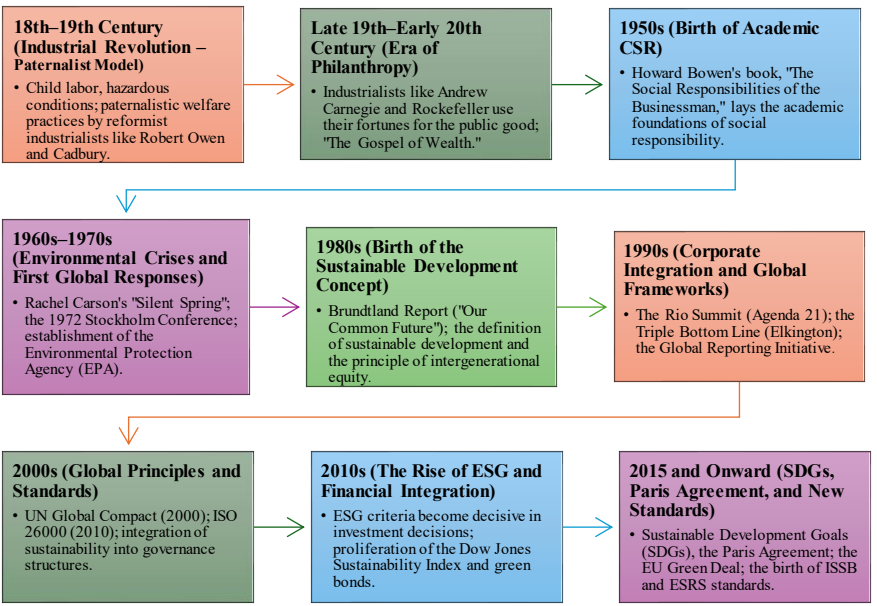


Figure 1-3 The Evolution of Corporate Sustainability: Global Standards and Policy Milestones

The origins of the debate on corporate responsibility can be traced back to the Industrial Revolution. The rapid industrialization of the 18th and 19th centuries, while enabling unprecedented increases in production and wealth accumulation, also gave rise to severe social problems such as mass migration, unhealthy urbanization, hazardous working conditions, and child labor (Carroll, 1979). During a time of limited government intervention, the earliest forms of corporate responsibility were voluntary acts driven by the personal moral and religious convictions of industrialists. This approach became synonymous with a paternalistic model, in which the business owner assumed the welfare of their employees like a father figure.

The most prominent examples of paternalism are seen in the practices of reformist industrialists in Britain, such as Robert Owen, the Cadbury family, and the Rowntree family. Owen improved working conditions in his factories, limited child labor, and provided housing and education for his workers. The Cadbury family, guided by their Quaker faith, built model villages for their workers, raising their living standards (Windsor, 2001). Unlike modern strategic sustainability, these practices were primarily focused on the company's internal stakeholders and were shaped by the personal ethical values of their leaders.

Starting in the late 19th century, the concept of corporate responsibility shifted from paternalism to a broader model of social philanthropy. This shift was particularly evident in the United States, as industrialists like Andrew Carnegie and John D. Rockefeller used their vast fortunes for the public good. Carnegie's essay, "The Gospel of Wealth", formed the intellectual foundation for this approach by arguing that wealth was not merely an individual right but also a responsibility to contribute to the welfare of society (Carnegie, 1889). During this period, corporate social responsibility was institutionalized not by individual moral choices, but through structures like libraries, universities, and art institutions that contributed to social development.

Modern CSR discussions gained an academic framework with Howard Bowen's book, *The Social Responsibilities of the Businessman* (1953). Bowen established CSR as a systematic field

of study by emphasizing the obligation of businesses to develop policies aligned with societal values, laying the groundwork for subsequent literature (Bowen, 1953). The 1960s and 1970s were a critical period when social responsibility discussions began to include the environmental dimension. Rachel Carson's book *Silent Spring* (1962) launched the modern environmental movement by exposing the devastating effects of pesticides on ecosystems and human health (Lytle, 2007). The first Earth Day in 1970 demonstrated that environmental awareness had gained global attention. This awareness led governments and international organizations to place environmental issues on their policy agendas, with milestones such as the establishment of the Environmental Protection Agency (EPA) in the U.S. and the UN's 1972 Stockholm Conference (United Nations, 1972). The Stockholm Conference was a turning point, marking the first time environmental problems were addressed on a global policy agenda and is considered the beginning of modern environmental management.

In parallel with these social and political transformations, significant academic debates took place concerning the scope and limits of the CSR concept. Free-market advocates like Milton Friedman argued that the only social responsibility of business was to maximize shareholder profit, labeling expenditures on CSR as a form of "theft" (Friedman, 2007). Addressing this assessment, scholars like Archie Carroll worked to refine CSR into a more structured framework. Carroll conceptualized corporate accountabilities as a four-tiered pyramid consisting of economic, legal, ethical, and discretionary (philanthropic) responsibilities. This model, which proposed that CSR is a multi-dimensional and hierarchical structure that should permeate a firm's core operations beyond mere legal compliance or charity, profoundly influenced CSR literature in the years that followed (Carroll, 1979).

The growing environmental awareness of the 1970s paved the way for a more complete approach that connected the dots between environmentalism, development, and social justice. During this period, the paradigm of "sustainable development" came to the forefront, merging environmental, developmental, and social justice issues. The 1987 Brundtland Report by the UN World Commission

on Environment and Development famously defined sustainable development as "development that meets the needs of the present without compromising the ability of future generations to meet their own needs", emphasizing principles of intergenerational equity (Dresner, 2009; Mebratu, 1998). This report laid the theoretical groundwork for a shift from "limits to growth" debate to the pursuit of "pathways to sustainable development" by combining environmental protection with development goals.

The 1990s and 2000s were a period when sustainability principles were integrated into corporate strategies. Agenda 21, adopted at the 1992 Rio Summit, identified businesses as key actors in achieving global sustainability goals, while the TBL approach emphasized the need to evaluate social, environmental, and financial dimensions together (Elkington, 1998b; Hart, 1995). The need for performance measurement and reporting grew during this time, and the GRI, established in 1997, developed transparent and comparable standards for sustainability reporting. This era also saw the emergence of new management positions like "Chief Sustainability Officer" and a more systematic integration of sustainability into corporate structures. The shift of sustainability from being merely a communication tool to a central element of strategic decision-making brought about a radical change in the architecture of corporate governance.

In the transition from CSR to sustainability, the UN Global Compact (2000), which defined principles-based commitments, and the ISO 26000 Social Responsibility Standard (2010), played significant roles alongside the GRI in embedding the concept into corporate governance. These frameworks played a key role in institutionalizing sustainability, extending its reach from reporting to governance. The Global Compact, launched in 2000, stood out as a voluntary platform inviting companies to adhere to ten universally accepted principles in the areas of human rights, labor standards, the environment, and anti-corruption, and to regularly report their progress to the public (Rasche & Kell, 2010). This commitment turned sustainability into a strategic element in the context of global competitiveness, not just an ethical goal. In parallel, the ISO 26000 Social Responsibility Standard, published in 2010, while not subject

to certification, provided organizations with a guiding framework on stakeholder engagement, human rights, ethical behavior, and the core principles of social responsibility (Herciu, 2016). As a managerial framework for integrating sustainability into operational processes, ISO 26000 went beyond reporting to become a reference point that directly touched upon the strategic planning of organizations.

From the 2010s onward, ESG criteria became strongly integrated with financial markets. High ESG performance evolved into a rational strategic choice, associated not only with ethical gains but also with reduced capital costs and improved long-term financial performance (Gillan et al., 2021). This was the turning point when sustainability was no longer just a high-minded ideal; it had become an essential component of a company's financial strategy. This ESG-based approach triggered a wave of new investment vehicles and financial mechanisms. Concrete indicators of this shift included; Socially Responsible Investing (SRI) funds, which invest only in companies meeting specific ethical and environmental criteria (Schueth, 2003); green bonds, which aim to directly finance environmental projects like renewable energy or clean water; and indices like the Dow Jones Sustainability Index (DJSI), which list companies with the highest ESG performance (López et al., 2007). These instruments did more than just channel capital into sustainable projects; they also created pressure for companies to continuously improve their ESG performance. As a result, companies started treating sustainability not just as a moral responsibility, but as a key part of their competitive strategy

Global policy frameworks further accelerated this transformation. The SDGs, adopted in 2015, assigned businesses concrete responsibilities across 17 goals, ranging from climate action to gender equality (United Nations, 2015). The Paris Agreement, signed the same year, directly guided the long-term strategies of companies with its decarbonization policies aimed at limiting the global temperature increase to well below 2°C. As a result of these developments, ambiguous “declarative visions” were no longer enough; companies now had to track their sustainability goals using measurable, verifiable, and time-bound indicators.

The concept of sustainability has evolved far beyond the simple “take-make-dispose” model , favoring smarter strategies like the circular economy, a system designed around resource efficiency and turning waste into value. (Kirchherr et al., 2017). The modern company is now held responsible for more than just maximizing profit; it must also define a clear social and environmental purpose and share it transparently with all stakeholders.

This paradigm shift is also evident in reporting standards, where the creation of the ISSB has launched a global process of harmonization. Disclosing the impact of sustainability risks on financial statements is no longer just good practice but has become a de facto expectation. Despite these advancements, significant challenges remain. Greenwashing continues to call the sincerity of corporate sustainability efforts into question, while persistent methodological issues make it difficult to reliably compare ESG data. These problems clearly reveal why the global reporting standards, which will be discussed in detail in the later chapters of this book, are of such critical importance.

The historical evolution summarized above reveals what corporate sustainability is and how it has transformed over time. This journey, from paternalistic philanthropy to strategic ESG management, demonstrates how social crises and global policies have shaped the strategic orientation of companies. Yet, this historical narrative alone does not present the complete picture. This begs a crucial question about corporate motivation: Why would profit-focused companies voluntarily shoulder the complex and costly burden of environmental and social responsibility? What is the real motivation that drives them to adopt these strategies? To understand what's really driving this corporate behavior, we need to turn to theoretical frameworks. The next chapter explores the “why” behind sustainability strategies by examining foundational theories such as Stakeholder Theory, Legitimacy Theory, and Corporate Citizenship. These theories help explain the underlying reasons for this historical transformation.

2.2.The Theoretical Foundations of Corporate Sustainability

The historical overview in the previous chapter reveals that societal demands and political pressures have been the driving forces behind the evolution of corporate sustainability. Yet, this historical narrative alone doesn't fully answer a key question: why are so many companies now actively embracing sustainability? This is where theoretical frameworks become essential. They allow us to grasp the motives of compelling firms to take on environmental and social responsibilities, and just as critically, to understand how these new priorities are woven into the fabric of their corporate decision-making. Companies aren't just passively reacting to the world around them. They are dynamically making strategic choices to protect their reputation, navigate complex relationships, and ensure their own long-term survival.

This chapter therefore turns to four foundational theories that drive the practice of corporate sustainability: Stakeholder Theory, Legitimacy Theory, the complementary perspectives of Agency and Stewardship Theories, and Corporate Citizenship Theory. These are by no means abstract concepts confined to academic debate; they generate tangible, real-world consequences, directly influencing how companies report their performance, engage with investors, and interact with regulatory bodies.

Accordingly, the purpose of this section is to lay bare the theoretical logic driving corporate sustainability strategies, thereby establishing the conceptual groundwork for the reporting standards and implementation models that will be examined in the subsequent parts of this book.

Stakeholder Theory, Legitimacy Theory, the dual perspectives of Agency and Stewardship, and Corporate Citizenship Theory provide the intellectual scaffolding for our inquiry. Moreover, the influence of these theories extends far beyond academic debates, actively shaping corporate reporting, the tone of investor relations, and discussions with regulators. By analyzing the profound impact these theories, this chapter builds a robust conceptual foundation for the practical discussions that are to follow.

2.2.1. Stakeholder Theory

One of the most frequently referred theoretical frameworks to explain corporate sustainability is Stakeholder Theory, developed in 1984 by R. Edward Freeman (Freeman, 1984). His approach mounted a foundational critique of the "shareholder primacy" model, which had long dominated business management with its assertion that a company's fundamental responsibility was solely to maximize shareholder wealth. Freeman argued that corporations are not merely economic units accountable only to their owners; instead, he posited that they are social and political organisms bearing responsibilities to *all* groups that are affected by, or can affect, their operations. This expansive view includes employees, customers, suppliers, financiers, the government, local communities, and even the natural environment itself.

The theory's central thesis is that a company's long-term success is contingent upon its ability to skillfully balance the interests of all these stakeholders and to create sustainable value for them collectively. Clarkson later refined this view by distinguishing between primary stakeholders, those critical to the firm's very survival, such as employees, customers, and suppliers, and secondary stakeholders, who influence or are indirectly affected by the company's activities, such as the media or non-governmental organizations (Clarkson, 1995). Within this framework, a narrow focus on the short-term expectations of shareholders invites the perilous risk of losing the support of other vital stakeholders, for instance, talented employees or loyal customers, a situation that ultimately jeopardizes the company's long-term viability.

From this perspective, corporate sustainability is essentially a strategic way of managing stakeholder relationships. A company's effort to reduce its environmental footprint isn't just a 'green' gesture; it's a strategic move to secure support from society, regulators, and investors. Similarly, offering fair wages and career opportunities isn't just about doing the right thing; it's a crucial strategy for attracting and keeping the best talent. Conducting ethical audits in the supply chain is a key strategy for safeguarding a company's reputation and preserving the loyalty of its customers.

Stakeholder Theory reframes sustainability, elevating it as a holistic business strategy that aims to create simultaneous economic, social, and environmental value for all stakeholders, thereby enhancing the company's long-term competitive strength (Freeman et al., 2007). However, the theory does have practical challenges. The theory doesn't offer a clear roadmap on how to prioritize stakeholders when their interests conflict, for instance, the constant trade-off between paying employees higher wages and offering customers lower prices. This ambiguity created a clear need for practical tools, leading to the development of things like stakeholder prioritization matrices and multi-criteria decision-making methods. Today, Stakeholder Theory stands as one of the most powerful models forming the basis of the 'double materiality' approach, a concept central to modern ESG reporting.

2.2.2. Legitimacy Theory

Legitimacy Theory offers a powerful sociological explanation for why companies don't just adopt sustainability practices, but also why they feel the need to report their performance to the public. According to this theory, a business's continued existence hinges on more than just fulfilling its legal obligations or meeting its economic targets; it is fundamentally dependent on creating a widespread perception that its operations are aligned with the values and norms of society. In Suchman's classic definition, legitimacy is "*a generalized perception or assumption that the actions of an entity are desirable, proper, or appropriate within some socially constructed system of norms, values, beliefs, and definitions*" (Suchman, 1995). This perspective emphasizes the reciprocal nature of the relationship between a business and its surrounding community. A company's continued ability to operate depends not only on financial capital but also on maintaining the trust and goodwill of society an intangible resource as critical as monetary assets.

A "legitimacy gap" widens when a company's actions fall out of sync with public expectations, creating a deficit in its social trust. This gap is not just a matter of image or reputation. It can trigger real business threats: customers may turn to boycotts, talented employees

may be harder to keep, investors may lose confidence, and regulators may respond with tougher oversight. (Deephouse & Suchman, 2008). A stark example can be seen when companies held responsible for major environmental disasters face not only legal sanctions, but a protracted crisis born from the collapse of their social legitimacy.

Viewed through the lens of Legitimacy Theory, corporate sustainability practices, and sustainability reporting in particular, are strategic tools that companies use to manage this legitimacy gap. Transparently reporting on issues like reducing carbon emissions, conserving water resources, or respecting human rights in the supply chain is more than just stakeholder communication; it functions as a signal of trust, proving that the company remains faithful to its side of the social contract (Deegan, 2002). This theory suggests that the push for sustainability is not only about 'doing the right thing. It is also a strategic necessity, essential for maintaining social acceptance and, in the long run, ensuring the organization's survival.

Today, this pressure is even more noticeable, anchored in legal requirements like the EU's CSRD. Regulations now force companies to report their sustainability performance explicitly, turning legitimacy from a matter of choice into a legal requirement. The Volkswagen emissions scandal demonstrates what is at stake: the loss of legitimacy can cost billions in fines and trigger a reputational crisis that is painfully slow to repair.

One of the main critiques of this theory is that the search for legitimacy does not always lead to genuine change. Companies may instead rely on symbolic gestures or sophisticated forms of greenwashing to protect their image. Legitimacy, therefore, is not a static prize to be won and held. Instead, it is a fluid and relational condition, one that must be continuously negotiated and rebuilt in the perceptions of investors, policymakers, and the public.

2.2.3. Agency Theory versus Stewardship Theory: A Foundational Contrast

Managerial motivations for corporate sustainability can be better understood by contrasting two long-standing but opposing perspectives in management research: Agency Theory and

Stewardship Theory. Each of these approaches starts from a very different view of what motivates managers and how they interact with shareholders.

Agency Theory is a foundational concept in finance and management, highlighting the natural tension between company owners, or principals, and the managers, or agents, entrusted to run the business on their behalf. (Jensen & Meckling, 1976). At its core, the theory assumes that owners and managers are rational players, each inclined to maximize their own self-interest. From this perspective, there is no guarantee that managers will act in the best interests of shareholders. Instead, it is often expected that managers may act to boost their pay, career advancement, or status, even if those decisions come at the expense of shareholder value. To mitigate this "agency problem", companies develop various incentive and control mechanisms. Stock options or performance-based bonuses are such systems designed to monitor managers (monitoring costs) and align their interests with those of shareholders. From this skeptical perspective, managers will only embrace sustainability strategies if those strategies create demonstrable short-term shareholder value. On the other hand, long-term environmental and social investments are typically relegated to a secondary concern.

Offering a direct counter-narrative to this rather pessimistic view of human nature, Stewardship Theory approaches managerial motivations from a vastly different angle (Davis et al., 1997). This theory sees managers not as agents chasing their own gain, but as stewards who protect and nurture the company's resources entrusted to them. Their main drive is the long-term success of the organization, prioritizing sustainable growth and value creation for all stakeholders over personal gain. Accordingly, the theory assumes a natural convergence between managerial and shareholder interests. The theory consequently encourages that managers should be trusted and granted greater autonomy.

The stark contrast between these two approaches provides a critical analytical lens for viewing the adoption of sustainability strategies. Assuming that sustainability investments often clash with short-term profit targets, Agency Theory approaches such initiatives

with caution. Stewardship Theory, in contrast, sees sustainability as an essential component of the company's long-term health and resilience. A steward manager recognizes that enhancing resource efficiency, retaining skilled employees, and fostering community trust are integral to strengthening a company's long term competitive position.

The strongest criticism of Stewardship Theory concerns its optimistic assumption that managers are inherently well-intentioned and focused on the collective good, an assumption that may not always hold true in practice. It is precisely at this point that considering both theories in tandem allows for a more realistic analysis of managerial behavior. This hybrid approach, which seeks to establish a delicate balance between control and trust within corporate governance, offers a pathway to managing sustainability performance in a way that is both effective and ethical.

2.2.4. Corporate Citizenship Theory

Corporate Citizenship Theory approaches the societal role of the corporation from a political and ethical standpoint, looking beyond a purely economic dimension. This perspective assesses companies not purely as profit-seeking economic entities but as "corporate citizens" of societies in which they operate. The argument is that just as individual citizens possess certain rights and obligations, corporations also have rights (such as property rights and legal protection) and must, in turn, shoulder certain responsibilities for society. This framework positions sustainability not solely as a tool for managing opportunities or risks, but as a moral duty that must be fulfilled.

The "extended corporate citizenship" approach developed by Matten and Crane takes this perspective a step further (Matten & Crane, 2005). According to this view, globalization has expanded the economic and political influence of multinational corporations, but it has also weakened the ability of governments in developing countries to protect citizens' fundamental rights. In this power vacuum, corporations become, in effect, de facto political actors. For example, a mining company's water management policies can directly impact a local community's right to access clean water.

Similarly, a global retail chain's supply chain practices can become more decisive in the protection of labor rights than state regulations. Thus, whether they realize it or not, companies end up playing a central role in the protection, or violation of citizens' basic rights.

From this vantage point, corporate sustainability is a tangible manifestation of corporate citizenship responsibilities. Reducing carbon emissions is not just an environmental policy; it is an expression of respect for the individual's right to clean air. Prohibiting child labor in supply chains means protecting basic human rights, while investing in healthcare or education for local communities is understood as reinforcing social citizenship rights. According to this theory, these actions are not simply tools for maximizing profit or securing legitimacy; they reflect the moral and political responsibilities of companies as members of society.

Corporate Citizenship Theory, rather than explaining sustainability-focused actions through instrumental motives like profit maximization or the quest for legitimacy, evaluates them within the framework of the moral and political responsibilities that companies hold as inseparable parts of society. This perspective elevates corporate sustainability beyond a ordinary management strategy, assigning an ethical mission to companies and carving out a societal role for them that transcends legal obligations. However, one of the most debated dimensions of this approach is that corporations, in assuming this political role, lack democratic accountability. The critical question of whether commercial interests or the public good will prevail when they select which social problems to address constitutes the most pointed critique of this theory. Consequently, where to draw the line on corporate citizenship, and how these roles can be harmonized with democratic oversight, lies at the heart of current academic and political debates. This discussion also intersects with concepts like stakeholder capitalism and the “social license to operate”, offering important clues as to how corporate citizenship may evolve in the future.

The theories outlined above provide different but complementary ways of understanding corporate sustainability. The most fundamental distinction among these theories is how they explain the motives behind sustainability initiatives. Stakeholder

Theory and Corporate Citizenship Theory stress that firms have a duty to act ethically and to serve society, building on a normative foundation of "doing the right thing". In contrast, Legitimacy Theory treats sustainability in a more instrumental way, arguing that companies adopt it primarily to stay accepted by society and secure their own survival. Stewardship Theory shifts the focus from external pressures to internal drivers, highlighting how managerial values, motivations, and oversight roles shape sustainability performance. These diverse yet intersecting perspectives are complementary in revealing the multidimensional character of corporate behavior. The core features and limitations of these theories are summarized comparatively in Table 2-1.

Table 2-1 A Comparison of Corporate Sustainability Theories: Focus, Motivations, and Limitations

Theory	**Focus**	**Role of the Company**	**Core Motivation**	**Key Limitation**
Stakeholder Theory	Relationships with stakeholders and value creation	An arbiter balancing the interests of all stakeholders	Ethical responsibility & long-term value maximization (Normative)	The operational difficulty of prioritizing and managing conflicting stakeholder interests.
Legitimacy Theory	Social acceptance and the "social license"	An actor conforming to social norms and expectations	Survival, access to resources, and risk avoidance (Instrumental)	The risk that actions may devolve into image management and greenwashing rather than genuine change.
Stewardship Theory	The motivations and behaviors of the manager	A structure where the manager is a "steward" safeguarding long-term well-being	Serving collective success and organizational health (Internal)	The idealistic assumption that managers are always rational and well-intentioned "stewards".
Corporate Citizenship Theory	The political and social role of the company	A "citizen" with both rights and responsibilities	Moral duty and contributing to the resolution of societal problems (Normative)	The risk of companies wielding political power without democratic accountability.

These four theoretical frameworks, while explaining the motivations behind corporate sustainability from different viewpoints, contain both complementary relationships and distinct tensions. For instance, the instrumental, survival-oriented logic of Legitimacy Theory explains why companies might adopt sustainability primarily as a tool for risk management and reputation protection. In contrast, the normative and moral approach of Corporate Citizenship Theory highlights the ethical duty underlying that same action. Therefore, a company's investment in a local school can be seen simultaneously as an act that strengthens its social legitimacy (Legitimacy Theory) and one that fulfills its societal duty as a responsible citizen (Corporate Citizenship Theory). In a similar way, the stewardship view in Stewardship Theory, which is built on managers' internal motivations, supports the need to meet external stakeholder expectations highlighted by Stakeholder Theory. However, a manager's focus on short-term financial incentives, as predicted by Agency Theory, could directly conflict with the long-term, multi-dimensional value creation required by Stakeholder Theory. For this reason, the sincerity and effectiveness of a company's sustainability strategy can vary significantly depending on which of these theoretical motivations is more dominant within its corporate culture.

In conclusion, considering these theories together enables a more comprehensive understanding of the multi-layered nature of corporate sustainability. In practice, a company's sustainability initiatives are often shaped by the convergence of these different motivations. For instance, a decision to reduce carbon emissions may simultaneously be driven by; (1) a sense of ethical responsibility to stakeholders affected by climate change (Stakeholder Theory), (2) the need to maintain legitimacy in the face of tightening regulations and social pressure (Legitimacy Theory), and (3) a managerial orientation toward long-term resource efficiency (Stewardship Theory. At the same time, such an initiative may also be interpreted as fulfilling the company's duty to society as a responsible 'corporate citizen' (Corporate Citizenship Theory). Therefore, fully grasping the complex web of motivations behind corporate sustainability

strategies is only possible when these theoretical perspectives are examined together.

2.3.A Conceptual Assessment of Corporate Sustainability Approaches

As discussed above, the concept of corporate sustainability has evolved from a simple philanthropic practice into a strategic management paradigm situated at the core of the global economy. Philanthropic approaches that emerged in response to the social problems of the Industrial Revolution gave way in the 1970s to ecological awareness, driven by public pressure over environmental crises. With the Brundtland Report in 1987, sustainability was reframed to include economic, social, and environmental dimensions in an integrated way. Starting in the 1990s, the adoption of the Triple Bottom Line and GRI standards brought measurable performance criteria into sustainability strategies. After 2010, the growth of ESG and investor-focused standards made it central to company valuation and the flow of capital. This evolution demonstrates that sustainability is no longer an optional side issue but a strategic foundation of corporate existence.

This historical evolution has progressed in parallel with specific theoretical frameworks, which have gradually influenced and reshaped one another over time. Stakeholder Theory sees companies as more than profit-driven actors for shareholders; it frames them as social entities balancing the interests of all stakeholders. In contrast, Legitimacy Theory explains the central role of public approval and the 'social license' in sustainability strategies. While Agency and Stewardship Theories focus on managerial motivations and the balance between control and trust, Corporate Citizenship Theory expands the perception of rights and responsibilities by emphasizing the ethical and political roles of companies. Taken together, these theories reveal corporate sustainability emerges from the interaction between external demands and managers' internal motivations. Most notably, the double materiality perspective brings these theories together, pushing companies toward a new way of managing that accounts for

financial as well as social and environmental impacts at the same time.

However, making sustainability a mainstream concern has created serious challenges. One major risk is that greenwashing can lead companies toward superficial reporting rather than genuine transformation, undermining stakeholder trust. Mitigating this risk requires strengthening independent verification mechanisms, adopting transparent reporting standards, and implementing governance models that enhance stakeholder participation. Companies also struggle with various reporting standards and the lack of global consistency, which adds to operational complexity. In this context, the IFRS Foundation's S1 and S2 standards, published under the ISSB, are regarded as a significant step toward creating a common global language for sustainability reporting.

Looking ahead, technologies such as AI and blockchain are expected to play transformative roles in sustainability management. AI can speed up ESG data analysis and improve risk prediction, assist faster and more reliable decision making, while blockchain adds transparency and traceability to supply chains, building greater public trust. Used effectively, these technologies will strengthen investor confidence and at the same time reinforce a company's social license to operate. The successful companies of the future will be those that build economic, social, and environmental value into their business models, pursue sustainability strategies that are transparent and accountable rather than greenwashed, and treat stakeholder trust as a core strategic asset.

3. THE TRANSFORMING NATURE OF SUSTAINABILITY REPORTING AND GLOBAL STANDARDS

The 1987 Brundtland Report defines sustainability as "meeting the needs of the present without compromising the ability of future generations to meet their own needs". This definition extends beyond the environment, including social justice, intergenerational equity, and the safeguarding of long-term economic stability. (Aksoy Hazır, 2024). The UN's SDGs, announced in 2015, established a shared action plan for all countries and sectors by integrating the environmental, economic, and social dimensions of sustainability within a single framework. Over the last decade, as stakeholders have come to expect greater transparency and accountability from corporations, the role of sustainability reporting has fundamentally changed: it is no longer just a legal obligation but has become a strategic instrument of corporate communication. Indeed, these sustainability reports provide significant benefits to companies, including the ability to gain social legitimacy, enhance brand value, and solidify investor relations (Akdoğan, 2024; Hyršlová, 2014).

This study embarks on a comparative analysis of the conceptual foundations of sustainability reporting and its major global standards. It not only compares the structural differences, materiality, and auditability of the standards but also examines the role of technological change and ethical concerns. Thus, the study provides not only a technical assessment but also a holistic and strategic evaluation of the future of corporate sustainability reporting. Drawing on a comprehensive review of the current literature, this analysis provides a conceptual framework for scholars and practitioners seeking to understand the evolving nature and increasing demands of sustainability reporting.

Understanding the evolution of academic and institutional interest in sustainability reporting requires a comprehensive examination of trends in literature. Bibliometric studies reveal a marked increase in the number of publications in this field, especially after 2015 (Özbingöl, 2025; Uğurlu & Özbingöl, 2024).

This surge is considered not just a quantitative growth but a noteworthy transformation in terms of interdisciplinary diversity and impact. Nowadays, research on sustainability reporting is no longer limited to accounting or management, it is also widely explored in ethics, environmental sciences, law, and public administration. This diversity enhances the intellectual depth of the field and fosters a rich interdisciplinary discourse. However, global analyses also show that the most cited works are predominantly produced in developed countries, a fact that creates significant inequalities in regional knowledge production (Hyk et al., 2023).

New regulations and mandatory reporting practices enacted in recent years have steered companies toward presenting non-financial information in a more systematic and structured manner. As a result, stakeholders no longer settle for financial data alone; they now expect broad access to environmental and social performance metrics as well. (Özdemir, 2024). Integrating sustainability information into corporate reports enhances the quality of information and makes it possible to assess company performance more comprehensively. (Akdoğan, 2024). This shift strengthens institutional governance through transparency and accountability and creates a strategic structure that supports value generation across short, medium, and long-term horizons.

The empirical analyses conducted by Benhayoun and colleagues also confirm this trend. According to the study, companies that comply with new regulations report non-financial data more systematically, and this practice strongly increases investor confidence. The evidence points to a rising worldwide demand for standardized sustainability reporting. Investors increasingly value firms that issue sustainability reports, regarding those that provide trustworthy and comparable information as lower-risk and more predictable in their investment decisions. At this stage, legally supported independent assurance audits play a vital role in boosting the trustworthiness of reporting and reinforcing its legitimacy for stakeholders. (Tutar & Keskin, 2024).

At the organizational level, sustainability reporting delivers advantages both inside the company and in its external relations Within the company, keeping track of sustainability metrics supports

smarter strategy updates, early recognition of long-term risks, and gains in efficiency. Externally, sustainability reports serve as practical tools for strengthening stakeholder confidence, shaping public perception, and demonstrating legal compliance. Therefore, sustainability reporting goes beyond providing a competitive edge, it is viewed as a key governance mechanism for securing organizational continuity and fulfilling social obligations. To grasp where sustainability management is heading, it is vital to examine how global and national standards are developing and how firms are learning to comply with them.

3.1. Global Standards and Compliance Challenges in Sustainability Reporting

Today, global problems like the climate crisis, pollution and resource scarcities have turned sustainability into a top priority, not only environmentally, but also economically and socially, for states, public agencies, and businesses alike. For companies, sustainability is about earning profit while respecting environmental, social, and governance standards (Şahin et al., 2018). Within this outline, companies are expected not only to produce goods and services but also to fulfill their societal responsibilities, demonstrate environmental stewardship, and have due regard for the expectations of all their stakeholders.

Presenting these responsibilities in a transparent, verifiable, and comparable way is achievable through sustainability reporting Sustainability reporting not only strengthens corporate transparency but also serves as a strategic tool in managing ESG-related risks. Early voluntary reports let companies present their sustainability record on their own terms while also shaping a positive corporate image (Şahin et al., 2018). However, the lack of adequate transparency and accountability reduced the comparability of reports and drew significant criticism. In this context, Non-Governmental Organizations (NGOs) and regulators have advocated for mandatory reporting, claiming it would make corporate responsibilities more credible and reliable (Aksoy Hazır, 2024).

Indeed, reporting based on voluntary principles enabled some businesses to mislead the public by cherry-picking positive

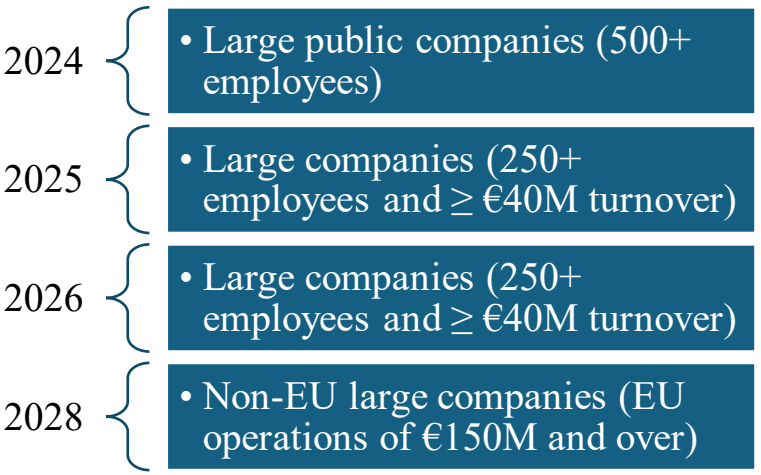
data, giving rise to the practice known as “greenwashing”. This situation made it exceedingly difficult for investors and other stakeholders to conduct a holistic and objective assessment of a company's sustainability performance (Lyon & Maxwell, 2011). The problems that emerged from this landscape created a powerful motivation for the development of stricter audit mechanisms and for elevating reporting frameworks to the status of a legal requirement.

3.1.1. The Development and Differentiation of Global Standards

Issues with voluntary reporting and the demand for greater standardization, have driven the rise of multiple sustainability reporting frameworks worldwide. Although no single binding global sustainability standard currently exists, numerous frameworks with distinct geographic scopes and thematic priorities are in place. Among the most prominent are the initiatives such as the GRI, the Carbon Disclosure Project (CDP), the Climate Disclosure Standards Board (CDSB), the International Integrated Reporting Council (IIRC), the Sustainability Accounting Standards Board (SASB), and the Task Force on Climate-related Financial Disclosures (TCFD). However, this diversity, combined with the voluntary nature of the frameworks, has resulted in significant differences in the scope, content, and format of reports, which has severely constrained their comparability at both national and international levels. To solve the problem of comparability, a few global standards are beginning to take shape, gaining broad acceptance across public and private sectors and gradually becoming institutionalized. Some of the accepted international standards are as follows:

Global Reporting Initiative (GRI): The GRI is the most widely accepted reporting framework globally. It presents principles and indicators for environmental, social, and economic performance in a systematic structure. The process, which began with the fourth generation Sustainability Reporting Guidelines (G4), transitioned from guidance to universal standards from 2016 onward. This shift institutionalized core principles of reporting: accuracy, balance, clarity, comparability, and reliability.

European Sustainability Reporting Standards (ESRS): Developed by the European Financial Reporting Advisory Group (EFRAG), these are the standards applied throughout the European Union under the CSRD. The first set of ESRS was published in July 2023 and took effect for certain large-scale enterprises as of January 1, 2024. The ESRS framework comprises 12 standards covering environmental, social, and governance dimensions. Double materiality is its most defining feature, requiring disclosure of both a company's impacts on sustainability and the risks that sustainability issues pose to the company itself. The implementation of the standards is being carried out according to the CSRD's phased timeline, a process that is a critical determinant for the preparedness of SMEs. This implementation timeline is summarized in Figure 3-1.



The obligation applies to large publicly traded companies as of 2024, while publicly listed SMEs will be subject to the requirement from 2026. SMEs without reporting obligations will be indirectly impacted by the supply chain reporting demands of large undertakings.

Figure 3-1 CSRD Phased Implementation Timeline (2024–2028)

IFRS Sustainability Disclosure Standards: The ISSB, established by the IFRS Foundation in 2021, set out to develop a comprehensive set of standards enabling investor-focused, comparable, and high-quality sustainability disclosures. The first of these, IFRS S1 (General Requirements for Disclosure of Sustainability-related Financial Information) and IFRS S2 (Climate-related Disclosures), were issued in June 2023 and became effective on January 1, 2024. IFRS S1 requires businesses to disclose all short, medium, and long-term sustainability-related risks and opportunities. IFRS S2, designed to be used in conjunction with S1, regulates the reporting of specific climate-related information. These standards are based on a financial materiality approach, placing enterprise value at the center and aiming to strengthen comparability in global capital markets.

The development of these standards follows a transparent and participatory due process, carried out openly and subject to public consultation rather than behind closed doors. This method typically includes the preparation of a draft standard, the collection of public feedback, and the publication of the final standard. Crucially, how these bodies are governed reflects the very spirit of the standards they produce. For example, the GRI standards are issued by the multi-stakeholder Global Sustainability Standards Board (GSSB), consistent with GRI's inclusive orientation. The ISSB, in contrast, operates within the market-oriented IFRS Foundation and is primarily composed of finance and accounting experts, a structure that reinforces its sharp investor focus.

The methodological differences between the IFRS's financial materiality axis and the ESRS's double materiality perspective, which encompasses all stakeholders, become particularly apparent in key topics such as governance and the value chain. On governance, IFRS S1 primarily focuses on the oversight processes for sustainability-related risks and opportunities. ESRS 2 is much more specific, demanding detailed disclosure of how management, policies, and due diligence systems handle sustainability issues.

In terms of the value chain, ESRS takes a remarkably broad view, requiring companies to comprehensively identify and disclose material impacts, risks, and opportunities across their entire value

chain. In contrast, IFRS S1 narrows the scope to only those elements that could directly affect the company's financial position. In the context of forward-looking disclosures, the ISSB places particular emphasis on anticipated future cash flows. Meanwhile, the ESRS exhibits a more prescriptive approach, demanding the disclosure of transition plans that align with the European Union's 2030 and 2050 climate targets.

Because of these structural differences, multinational firms working globally are required to report separately under each of the two standards. Consequently, for these companies, this dual reporting obligation both increases financial costs and complicates the coordination of their reporting processes.

3.1.2. Strategic Tensions, Stakeholder Expectations, and Critiques in the Standards Arena

The recent developments in sustainability reporting should not be viewed merely as a technical standard-setting process, but also as a reflection of a global struggle for governance and influence. This contest has taken the shape of a "standards competition", forged between the multi-stakeholder, policy-driven vision of the European Union on one side, and the investor-centric priorities of the Anglo-American financial system on the other. This competition is about more than just technical differences in reporting formats; it directly influences the direction of global capital flows, the alignment of regulatory frameworks, and the strategic positioning of corporations. Through the CSRD and ESRS, the EU is attempting to make its own values and rules a global norm, leveraging its regulatory power in a phenomenon known as the "Brussels Effect" (Bradford, 2020). Built on the EU's vision of multi-stakeholder capitalism and its double materiality perspective, this approach utilizes sustainability not just as risk management but as a broader duty, a moral and social responsibility for a company's impact on society and the planet. This amounts to a value-based governance export strategy, one that serves the EU's broader policy goals like the Green Deal and aims to export its core values, such as the social market economy and the precautionary principle, into global trade.

In direct opposition to this vision stands the ISSB's objective of creating a “global baseline”, backed by global capital markets and leading economic actors like the G20. The ISSB's approach is focused on providing information that is comparable, reliable, and financially meaningful for investors' decision-making processes. It therefore adopts the principle of financial materiality, incorporating sustainability issues into reporting only when they have a measurable impact on the company's financial performance. This divergence reflects two different notions of capitalism: the European Union's socially inclusive regulatory vision versus the ISSB's market-driven, investor-centric liberal model (Bebbington & Unerman, 2020). These two approaches, in turn, shape the expectations and critiques of different stakeholder groups regarding the standards.

- Investors and financial analysts, while welcoming the actionable information and global comparability offered by the ISSB, also acknowledge that the broad-based impact data required by the ESRS could play a critical role in foreseeing the future financial risks (Eccles & Serafeim, 2013).
- Civil society organizations (CSOs) and activists criticize the ISSB's narrow financial focus and champion frameworks like ESRS and GRI, which aim to make a company's environmental and social impacts visible, even if those impacts do not have a direct financial consequence. For these actors, sustainability reports are not merely informational tools but are also pressure mechanisms to hold companies accountable for their ecological and social responsibilities.
- Companies and their Boards of Directors face the challenge of navigating two different sets of expectations at the same time. Adhering to ISSB standards is essential for securing access to capital markets and investor trust, while compliance with ESRS is crucial for maintaining entry to the European market and avoiding regulatory penalties.

The most tangible consequences of this geopolitical competition are affecting multinational corporations operating on a global scale. These companies are forced to meet the EU's comprehensive impact reporting demands on one hand, while on the other, they must respond to the tighter, financially focused expectations of global investors. This means businesses have to run two sets of data collection and analysis in parallel, conduct different materiality reviews, and coordinate these workflows effectively. Furthermore, this dual compliance requirement necessitates that companies invest in appropriate IT infrastructure and utilize expert consulting services.

Attempts to align reporting standards face notable limitations and have drawn significant criticism. A central critique of the ISSB standards is that their narrow focus on financial materiality risks overlooking major environmental or social damage if such impacts do not appear directly on a company's balance sheet. According to critics, this approach confines sustainability to an "outside-in" dimension, that is, the world's impact on the company, while largely ignoring the company's "inside-out" impact on the world (Eriandani & Winarno, 2024). Conversely, the comprehensive and complex structure of the ESRS could create a significant administrative and financial burden for SMEs that are not directly within the scope of the CSRD but are part of the supply chains of large companies.

No matter how sophisticated standards become, the fundamental problem of data quality and reliability remains mostly unsettled. The measurement of Scope 3 emissions, which cover a company's entire value chain, poses serious challenges as it requires obtaining accurate and verifiable information from hundreds of suppliers. This situation also fuels the problem of "ESG rating divergence", where different ESG rating agencies assign completely different scores to the same company (Berg et al., 2019). Different methodologies, data sources, and the varying weight assigned to ESG factors raise concerns among stakeholders regarding the reliability of reported information. Therefore, critical need for the future of sustainability reporting are the harmonization of rating agencies' methodologies, the establishment of common performance metrics, and the standardization of audit processes. Aligning the

standards would not only make reporting process easier to compare but also help rebuild trust with investors and stakeholders.

Moreover, the existence of standards alone does not remove the risk of greenwashing; indeed, it may cause it to resurface in more nuanced forms. Today, instead of making overtly misleading statements, companies may engage in practices that are in full compliance with the law but do not result in any genuine operational transformation, a phenomenon termed "reporting-washing" in literature (Aust et al., 2024). Another trend that has recently garnered increasing attention is "green-wishing": in this approach, companies announce distant, long-term targets, such as for 2050, while avoiding the disclosure of concrete, short-term, and fully funded steps required to achieve them (Tavanti, 2025). Thus, while the reports give an impression of transparency on the surface, they may in fact mask fundamental problems.

In this context, the implementation of independent assurance audits to enhance the reliability of sustainability reporting, and the establishment of a standard framework for these audits, emerge as critical mechanisms for increasing the credibility and persuasiveness of reports in the eyes of stakeholders. The scope and function of these assurance mechanisms will be discussed in detail in the next chapter.

3.1.3. The Process of Aligning with Standards in Türkiye

In parallel with global developments, Türkiye has taken steps in alignment with the European Union by publishing the Turkish Sustainability Reporting Standards (TSRS) in the Official Gazette on December 29, 2023. The TSRS are, in essence, a direct adaptation and Turkish translation of the IFRS S1 and IFRS S2 standards developed by the ISSB (Tutar & Keskin, 2024). According to this regulation, companies exceeding an asset total of 500 million TRY, with annual net sales revenue over 1 billion TRY, and more than 250 employees have been brought under the scope of mandatory reporting as of 2024.

The implementation of TSRS aims to ensure uniformity and comparability in sustainability reporting within Türkiye. At the same time, it seeks to strengthen integration with international practices,

thereby increasing the country's access to green finance and its attractiveness to foreign investors. While this alignment process creates a strategic opportunity, particularly for Turkish companies that export to the European Union market, it also carries risks such as a dual reporting burden, cost pressures, and challenges in operational compliance. At this point, regulators play a critical role. Their job is not only to make sure the standards are applied correctly but also to guide companies and help them build the capacity they need for compliance.

However, setting sustainability reporting standards and making them legally binding does not by itself guarantee the expected impact in practice. In developing countries especially, the adoption of these standards is met with various obstacles, including a lack of corporate capacity, insufficient financial resources, and problems with administrative infrastructure. Indeed, the number of companies in Türkiye preparing sustainability reports until 2015 remained quite limited, and the reports that were prepared were often irregular and inconsistent. Structural problems such as inadequate regulation, the additional costs of reporting, and a shortage of qualified experts have reinforced this situation (Şahin et al., 2018).

Consequently, during the implementation of TSRS, the transition from a voluntary reporting culture to mandatory standards will bring with it corporate compliance challenges for many businesses. These challenges, frequently highlighted in the literature and also observed specifically in Türkiye, are summarized below (Akdoğan, 2024; Aksoy Hazır, 2024; Şahin et al., 2018, 2018):

- *Audit Requirement and Costs:* With the new regulations, sustainability reports must now undergo an independent audit. This adds new expenses for companies, covering everything from data collection and report writing to system integration and getting the reports out to stakeholders. The expanding scope of the reporting framework further increases this financial burden.
- *Need for Qualified Personnel and Training:* A primary reason for low reporting rates in developing countries is the lack of accountants and experts competent in the field of

sustainability. In most organizations, employees are not equipped to properly track sustainability goals, a situation attributed to insufficient training, the inability to connect the topic with other corporate initiatives, or a lack of authority. It is therefore crucial for businesses to receive targeted training on sustainability.

- *Need for Departmentalization:* To ensure the effective execution of sustainability activities, organizations should establish an independent sustainability department that is represented at the senior management level and integrated across the organization. Such a structure not only contributes to strategic decision-making processes but also ensures the continuity of reporting effectively.
- *Uniformity and Comparability Challenges:* Meeting international standards is key to making sustainability reports truly comparable. However, although TSRS is an adaptation of the ISSB standards, significant differences remain between different standard-setters like ISSB and ESRS in terms of thematic scope and level of detail. These differences complicate global comparability. On top of that, the double materiality principle adds extra reporting demands, often leading to problems of information overload.
- *Integration and Alignment Process:* With the shift from voluntary to mandatory reporting, the consolidation of financial and non-financial information under a single report has given rise to a new integration process. In this process, sustainability efforts are expected to be reported in a way that is aligned with the business's priorities and linked to the sustainable development goals.

When all these assessments are considered together, it is evident that global and national standards for sustainability reporting are evolving toward a more institutionalized and audit-based

structure. However, conceptual differences between the standards, especially the varying interpretations of the 'materiality' principle, create uncertainties regarding the content and scope of reporting. In countries like Türkiye, meeting these standards is not just technical, it also calls for broader change, including stronger corporate capacity and cultural adaptation. In this context, Türkiye's adoption of the TSRS, which is closely aligned with the ISSB approach, creates a methodological decoupling from the European Union's ESRS standard, which is based on double materiality. This situation has the potential to impose additional reporting obligations on multinational companies operating in Türkiye when seeking access to the EU market. Therefore, it is likely that companies exporting to the EU will face a dual reporting requirement and associated costs to ensure ESRS compliance. In this context, it is vital to closely examine the idea of 'materiality', one of the key principles of sustainability reporting, along with how it is defined, applied, and where its limits lie. In fact, the flexible nature of materiality assessments and the lack of strong auditing can open the door to greenwashing, letting companies make their sustainability record look better than it really is.

3.2.The Credibility Problem in Reporting: The Rise and Challenges of Assurance Audits

The shift of sustainability reporting from a voluntary initiative to a mandatory requirement under global standards represents a historic milestone for transparency. But on its own, this step does not guarantee that readily reliable reports. The continued risk of greenwashing, despite the existence of standards combined with inherently subjective and complex nature of ESG data, has created a significant"credibility gap" in the eyes of stakeholders, particularly investors. Corporate scandals and exaggerated sustainability claims in recent years have fueled skepticism about reported information and have eroded stakeholder trust (Farooq & De Villiers, 2017). To close this credibility gap and to have an independent party confirm the accuracy, consistency, and integrity of the information in these reports, the mechanism of assurance, long applied in financial reporting, has increasingly become a critical

requirement for sustainability reporting as well. Indeed, next-generation regulations like the CSRD no longer treat an independent assurance audit of sustainability information as an option, but as a legal prerequisite.

However, sustainability assurance is a process that is both more complex and more open to interpretation than a financial audit. While financial audits largely focus on standardized, quantitative, and historical data, sustainability audits exhibit a much more intricate nature. Audits in this domain cover not only backward-looking data but also qualitative indicators, scientific forecasts (such as climate scenarios), forward-looking targets, and value chain data that lie outside the company's direct control (O'Dwyer & Owen, 2005). This situation creates difficult methodological and technical challenges for auditors. Currently, the assurance services market is predominantly controlled by the 'Big Four' audit firms: PwC, Deloitte, EY, and KPMG. However, the financial auditing background of these firms has sparked academic and professional debate over whether they possess sufficient expertise in multidisciplinary areas of sustainability, including climate science, biodiversity, and social impact analysis (Cheng et al., 2015).

Currently, sustainability assurance is generally offered at two primary levels, which provide different degrees of confidence to stakeholders:

- **Limited Assurance:** This is a less extensive review in which the auditor concludes that no evidence has come to their attention that would cause them to believe the reported information is materially misstated. The process is generally confined to making inquiries about management and performing analytical procedures. The auditor uses negative phrasing, such as, "we have not encountered any matter that would lead us to believe the information is incorrect". The vast majority of today's sustainability reports receive this level of assurance, a fact that is a source of concern for investors accustomed to the high level of assurance in financial reports.

- **Reasonable Assurance:** This is the standard used in financial audits. It is a much more in-depth and evidence-based review in which the auditor expresses a positive opinion that the information is "fairly presented in all material respects". At this level, auditors test the company's internal control mechanisms, gather detailed evidence, and apply more comprehensive audit procedures. CSRD plans to require reasonable assurance in the medium term, but a number of complex obstacles such as inadequate technical capacity, costs and lack of experts still stand in the way.

While making assurance audits mandatory could improve the credibility and seriousness of reporting, there are still structural challenges that auditors and companies need to overcome:

- *Uncertainty of Criteria and Measurement Difficulties:* Unlike financial audits, which are guided by mature standards like IFRS, sustainability audits don't yet have universally agreed methods of measurement. For example, it is very difficult to turn broad ideas like a firm's 'net positive impact on biodiversity' or its 'corporate culture' into objective, measurable criteria for auditing. This opens greater scope for auditors' subjective judgments and may result in inconsistencies in audit quality.
- *Lack of Multidisciplinary Competence*: Sustainability audits demand a multidisciplinary approach that surpasses the boundaries of any single field of expertise. Audit teams are expected to have competence not only in accounting and auditing principles but also in fields such as climate science, engineering, human rights law, and supply chain management (Simnett & Huggins, 2015). However, the pool of professionals with such a broad interdisciplinary skill set remains very limited. This leads to a clear shortage of

expertise and capacity in both auditing firms and corporations.

- *Weakness of Internal Control Systems:* Unlike the internal controls for financial reporting, which have developed over decades, systems for collecting sustainability data remain relatively new, fragmented, and less automated. Gathering data manually from different units like HR, environmental management, or procurement raises the risk of mistakes and inconsistencies, making assurance audits more complex and extensive.
- *Inability to Verify Value Chain Data:* The hardest part of a sustainability audit is often checking data that lies outside a company's own operations. It is extremely difficult to reliably audit impacts such as Scope 3 emissions, which originate from the supply chain or the downstream activities. It is logistically and financially almost impossible for an auditor to physically inspect the working conditions, carbon emissions, or social impacts of hundreds or even thousands of suppliers scattered across different geographies. This situation means that some of the most critical sections of sustainability reports are limited to a weaker level of assurance.

Despite all these challenges, widespread adaptation of mandatory assurance audits represents an irreversible turning point that holds the potential to increase both the sincerity of sustainability reporting and its credibility among stakeholders. This development will require companies to fundamentally redesign not only their reporting practices but also their internal control structures, data collection mechanisms, and supply chain management processes.

3.3.A Critical Assessment of Global Reporting Standards

The evolution of corporate sustainability reporting, as explored in this chapter, highlights a fundamental change in both the

societal role of companies and the way they conduct business. Reporting, initially seen as a voluntary, largely public relations-focused, and non-comparable communication tool, has transformed into a strategic governance mechanism, one defined by global standards, positioned at the center of geopolitical competition, subject to independent audit, and backed by legal sanctions. The "standards war", stretching from the multi-stakeholder transparency pioneered by GRI, to the political and prescriptive framework established by the EU's ESRS, to the financially focused structure demanded by global capital markets through the ISSB, proves that sustainability is no longer a marginal concern for the business world. It has become something highly complex and highly contested at its core. This illustrates that sustainability reporting has moved beyond its beginnings as a technical accounting exercise to become a strategic arena where competing models of capitalism, stakeholder demands, and global power dynamics converge.

However, even these significant developments toward standardization harbor unresolved problems. As discussed in this chapter, the new standards, even in their improved state, cannot alone guarantee the reliability of reports. The ISSB's narrow focus on financial materiality risks obscuring corporate environmental and social impacts, whereas the ESRS's more comprehensive and detailed framework can impose heavy data burdens and significant compliance costs, particularly on SMEs. On top of that, ESG data still suffers from problems of quality, consistency, and verifiability, which makes it difficult to fully win stakeholder trust. Assurance mechanisms, created to close this credibility gap, are taking on a central role in reporting, but the practice of assurance is still in its early stages. Challenges in areas such as the need for multidisciplinary competence, the uncertainty of criteria, and the difficulty of verifying the value chain reveal the current limits of this new trust-building mechanism.

Looking ahead, sustainability reporting is projected to evolve into an increasingly integrated and technology-driven structure. Employing tools such as data analytics, blockchain verification systems, and AI-driven risk analysis have significant potential to improve the quality of reporting while also rendering assurance

processes more transparent and cost-efficient. These technologies go beyond facilitating compliance, reduce the effects of human bias, and enhance stakeholder trust by reinforcing the ethical dimension of reporting.

Ultimately, the real significance of sustainability reporting does not lie in legal compliance alone, but in its ability to transform a company's long-term value creation strategies. In this context, successful companies will be those that approach sustainability not as a compliance burden but as a tool for generating competitive advantage, managing risks, and building trust with stakeholders. Such firms will distinguish themselves as institutions that embed sustainability reporting into board-level strategic decision-making, analyze financial and non-financial indicators through a holistic value chain lens, and embed transparency and accountability within their organizational culture.

In conclusion, the framework depicted in this chapter reveals that sustainability reporting has been irreversibly installed at the core of corporate strategy. The fundamental question for companies is no longer whether to report, but rather a series of new questions: according to which philosophy, prioritizing which stakeholders, using which technological tools, and for what long-term strategic purpose. In this context, debates on materiality, data management and regulatory compliance strategies, have moved to the top of the corporate agenda. The single most critical concept that will undoubtedly determine the future of sustainability reporting is "materiality". The debates around financial versus double materiality will reshape not only the content of reports, but also ethical responsibilities, stakeholder relations, and the very social legitimacy of corporations.

In the following chapters, the different interpretations of this key concept, impact materiality and financial materiality, will be addressed. How these approaches are applied in practice and how they shape the ethical dimension of reporting will be discussed in detail. Furthermore, predictions will be offered on how forward-looking technological innovations, such as AI-powered audits, blockchain-based verification systems, and data harmonization initiatives, could transform this process.

4. THE MATERIALITY PARADIGM, REPORTING ETHICS, AND THE RISK OF GREENWASHING

Materiality is a foundational concept in corporate reporting. This concept stands out as the fundamental criterion in sustainability reporting, determining which topics are included in a report and which are left out. A proper definition of this concept is of vital importance for the integrity and credibility of reporting. This is because a flawed or incomplete materiality assessment can severely undermine stakeholder trust by damaging the structural coherence of the report. The concept of materiality is central to identifying the economic, environmental, and social impacts of a business's operations. At the same time, it is this very concept that defines how influential these impacts are for stakeholders. The origins of the concept can be traced back to financial accounting and auditing practices. In traditional accounting literature, "materiality" is defined according to whether the omission or misstatement of a piece of information could reasonably influence the economic decisions of users (Messier et al., 2005). This concept has long served as a critical key measure for investors, shaping their decision making based on corporate financial information. In recent years, it has become increasingly important in sustainability reporting, where companies are also required to disclose non-financial information (Calabrese et al., 2017; Jones et al., 2016).

As sustainability reporting has become more common, the concept of materiality has had to evolve beyond its narrow financial origins. In the context of sustainability, materiality no longer just concerns investors. It now encompasses issues that can influence the assessments and decisions of a much broader spectrum of stakeholders, including employees, customers, local communities, suppliers, and civil society. This expanded definition includes any topic that directly or indirectly impacts a company's ability to create, preserve, or erode economic, environmental, and social value across the short, medium, and long term.

The core dynamic driving this evolution is the broadening definition of stakeholder. While in traditional finance, the investor was the sole stakeholder of consequence, the landscape has fundamentally shifted in the era of sustainability. Talented

professionals seeking to work for ethical companies, conscious consumers choosing sustainably sourced products, and local communities granting a firm its social license to operate have all become critical stakeholders directly influencing a company's long-term success and value. The choices these new stakeholders make are no longer based solely on the balance sheet; they are also shaped by the company's human rights record, its environmental footprint, and its contributions to society. Ultimately, materiality has transformed from meaning what is material to the investor to what is material to all key stakeholders within the company's long-term value-creation ecosystem. This is a fundamental reframing of the concept.

However, in sustainability, materiality goes beyond accounting jargon; it becomes a strategic way to deal with social, environmental, and governance risks. This broader conceptualization has subsequently generated a range of theoretical and practical criticisms. These assesses are concentrated around the following four key points (Eccles et al., 2012; Mio et al., 2020):

- *Lack of a Standardized Method:* The absence of generally accepted standard methods for determining materiality for non-financial information presents a more complex challenge compared to financial reporting. This difficulty is further compounded because each business has its own dynamics, sectors face different environmental and social impacts, and there is still no clear consensus on materiality itself.
- *Subjective Assessments:* The methods behind materiality analysis are often seen as subjective and commonly contested. While management's discretion in financial reporting is constrained by mandatory standards and audit mechanisms, such assessments in non-financial reporting are largely left to the initiative of the businesses themselves.
- *Sectoral and Regional Differences:* Because there are no standard rules for materiality, reporting practices can differ

widely, even among companies within the same sector. This, in turn, hinders sectoral comparisons and weakens stakeholders' perception of the reports' credibility.

- *Broad Stakeholder Expectations:* The wide and diverse range of stakeholder expectations makes it difficult to manage the differences between them, complicating companies' efforts to develop a comprehensive approach in their materiality analyses.

These four flaws create serious gaps in trust, generate significant gaps in corporate conviction and stakeholder perceptions within reporting processes. If materiality is applied incorrectly or partially, reports lose credibility, and the danger of greenwashing grows. These criticisms highlight the need for a broader, standardized way of defining materiality, one that weighs environmental and social impacts as well as financial ones. In response, the idea of double materiality emerged to address this need, and it now stands at the core of a new paradigm in sustainability reporting.

This chapter places materiality, this most fundamental and, at the same time, most delicate concept in sustainability reporting, at its center. First, the study will analyze the practical implementation of the double materiality approach, as well as the challenges it presents and criticisms it has raised in academic debates. Today, materiality cuts both ways, on one hand it can promote transparency, but if misread, it gives companies room to exploit it for strategic gain. The ambiguity of the concept might create fertile ground for 'greenwashing,' arguably the biggest ethical issue in reporting. Therefore, this chapter does not content itself with merely explaining a technical reporting criterion; it also discusses how the principle of materiality intersects with greenwashing strategies, the ethical and governance dimensions of this intersection, and what corporate or technological mechanisms might be used to address the issue.

4.1. The Double Materiality Paradigm: From Theory to Practice and Critique

To fully grasp the innovation of double materiality, it is essential to first understand its predecessor: the single materiality approach that has guided sustainability reporting for years. Single materiality, often referred to simply as “financial materiality”, evaluates sustainability (ESG) issues exclusively based on their impact on a company's financial performance, position, and overall enterprise value. The fundamental question this approach asks is clear: How do environmental, social, and governance risks and opportunities affect the company profit? This perspective views sustainability topics through a traditional risk management lens, with the primary objective of protecting shareholder value. Crucially, single materiality adopts what is known as an outside-in perspective. In this view, the company is at the center of the analysis, and the external world, the environment, society, markets, and regulations are seen as a source of potential risks and opportunities that could impact the business.

The principle of double materiality transcends its function as a mere reporting technique to stand out as a paradigm that is fundamentally transforming corporate sustainability strategies, stakeholder relations, and risk management processes. These principal mandates that, in the context of sustainability, both financial impacts and environmental and social consequences must be considered and disclosed. The ESRS requires that businesses report all significant sustainability-related impacts, risks, and opportunities within this framework. Double materiality stipulates that a sustainability issue must be reported if it is significant to the company's financial performance (financial materiality), or if the company's operations have a significant impact on the environment and society (impact materiality), or if both conditions apply. Crucially, a topic only needs to meet one of these two criteria to be considered reportable. This significantly expands the scope of reporting and compels companies to think not just about themselves, but also about the broader ecosystem in which they operate. Thus, double materiality necessitates a two-way analysis, covering both the “inside-out” perspective (the company's impact on society) and

the “outside-in” perspective (the impact of societal developments on the company) (EFRAG, 2023):

- **Financial Materiality (The “Outside-In” Perspective):** This dimension addresses the reflections of sustainability-related issues, such as risks and opportunities arising from climate change, on the company's financial performance, market position, and long-term growth potential. Within this scope, assessments are made regarding how these factors create changes in cash flows, access to financing, and the cost of capital over the short, medium, and long term. Information is considered financially material if its omission, misstatement, or concealment could reasonably be expected to influence the decisions of the primary users of general-purpose financial reports, such as investors, lenders, and other creditors.
- **Impact Materiality (The “Inside-Out” Perspective):** This dimension focuses on the actual or potential, positive or negative impacts of the company's own operations and value chain on people and the environment. From an impact perspective, a sustainability issue is material if it involves real or potential effects, good or bad, on people or the environment, whether in the short, medium, or long term. This view stresses that a company’s broader responsibilities reach beyond financial results to include wider responsibilities toward society and the environment.

Possibly, the greatest strength of double materiality is its recognition that these two dimensions (financial and impact materialities) are not independent but rather coexist in a dynamic and cyclical relationship. What is considered only an impact today can turn into a concrete financial risk or opportunity in the future (GRI, 2025). This introduces the concept of dynamic materiality, which

recognizes that the significance of an issue may change over time and under evolving circumstances (Mwape et al., 2025).

This cyclical relationship often unfolds as follows: A company creates a negative environmental impact through its operations (inside-out), for example by producing large quantities of single-use plastic packaging. Initially, this may not have a direct financial cost. Over time, however, public awareness and consumer pressure begin to mount. This growing public objection can prompt governments to introduce new regulations, such as plastic taxes or bans. These external factors (shifting consumer preferences and new taxes) then transform into a tangible financial risk for the company (outside-in), as sales may decline and costs increase. A double materiality assessment enables companies to manage this cycle proactively. It allows them to anticipate not only current financial risks but also the future financial risks that could stem from their own impacts. With this foresight, a company can turn that risk into an innovative opportunity; for example, by investing in alternative packaging solutions. This transforms the process from a static analysis into a continuous strategic dialogue that requires constant foresight.

While this holistic approach offers a remarkably comprehensive framework on a theoretical level, in practice it demands an extremely complex and multi-stage analysis process. Conceptually, a company's double materiality analysis process includes the following key steps (Edgley et al., 2015):

i. *Scope Definition and Stakeholder Mapping:* The company first defines an area of impact covering its entire value chain. This scope includes both upstream (suppliers) and downstream (customers) actors. At this stage, all key stakeholders, such as employees, investors, customers, NGOs, local communities, and regulatory authorities, who are directly or indirectly affected by the company's activities or who can affect its operations are systematically identified and mapped.

ii. *Listing of Potential Material Topics:* A comprehensive list of potential topics is compiled by drawing on industry-specific standards (e.g., SASB), stakeholder surveys, interviews, media analyses, legal requirements, and corporate risk assessments. This list covers a wide range of areas, such as climate change, water management, employee rights, data security, or human rights etc.

iii. *Impact and Financial Materiality Assessment:* Each topic is examined from two perspectives using predetermined qualitative and quantitative criteria: (a) Impact Materiality, assessed through factors such as scale, scope, severity, and irreversibility of its effects on people and the environment; and (b) Financial Materiality, assessed through its potential impact on cash flows, financial performance, risk profile, or cost of capital.

iv. *Setting Thresholds and Creating the Matrix*: Using the scores, management sets a cut-off to decide which issues are 'material.' The results are then mapped on a matrix with one axis for impact materiality and the other for financial materiality. Topics that exceed the threshold values are included in the report.

v. *Verification and Reporting*: The topics identified as material are approved by senior management and the board of directors. These approved topics form the backbone of the sustainability report and are explained in detail with both quantitative and qualitative indicators.

To see holistically how a double materiality analysis functions as a strategic roadmap, a schematic summary of these steps is presented in Figure 4-1.

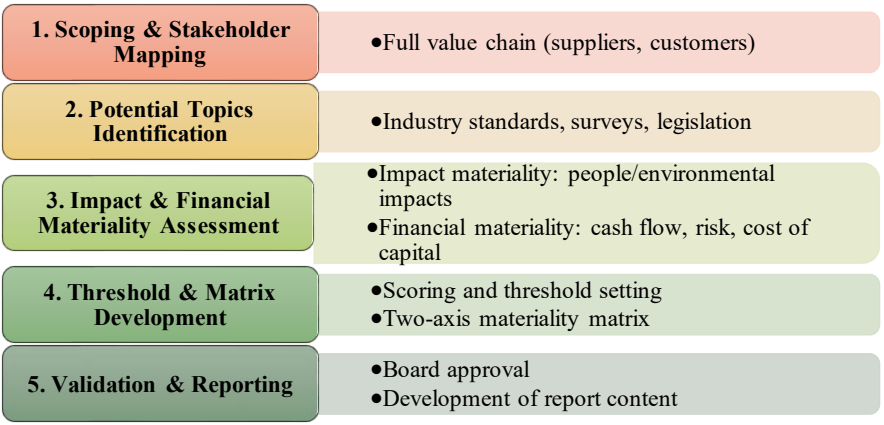


Figure 4-1 The Stages of the Double Materiality Assessment Process

Subjectivity and lack of methodological consensus pave the way for companies to selectively present data, highlighting only positive outcomes and thereby amplifying the risk of greenwashing. Although the process appears logical and comprehensive at a conceptual level, it encounters significant difficulties in practice and is the subject of various critiques in academic literature. Chief among these critiques is the high degree of subjectivity inherent in the process. Key decisions, such as the weight assigned to a stakeholder's opinion or the threshold for deeming an impact 'material', are largely determined at the discretion of company management. This dynamic enables companies to label issues they prefer not to address, or in which their performance is weak, as 'not material,' effectively excluding them from the scope of reporting (Eccles et al., 2012).

Moreover, the absence of universally accepted, standardized, and reliable methodologies for objectively measuring the financial dimension of highly complex impacts such as 'biodiversity loss' makes the credibility of materiality analyses even more contested. (Mio et al., 2020). Another practical challenge, particularly in large corporations with many stakeholders, is that repeated consultation and feedback cycles can eventually result in "stakeholder fatigue". Over time, the repeated invitation of stakeholders to surveys and

meetings may reduce their interest and participation, thereby undermining the representativeness and credibility of the analysis (Unerman, 2007).

Figure 4-2 visualizes the double materiality approach developed by the European Commission (European Commission, 2019b). Here, the financial materiality perspective (left) focuses on how external factors such as climate change shape a company's performance, growth potential, and market position, mainly for investors. In contrast, the environmental and social materiality approach (right) addresses the company's impacts on society, the environment, and the climate; in this respect, it responds not only to the expectations of investors but also to those of employees, consumers, and civil society. The combination of these two approaches constitutes the principle of double materiality in sustainability reporting.

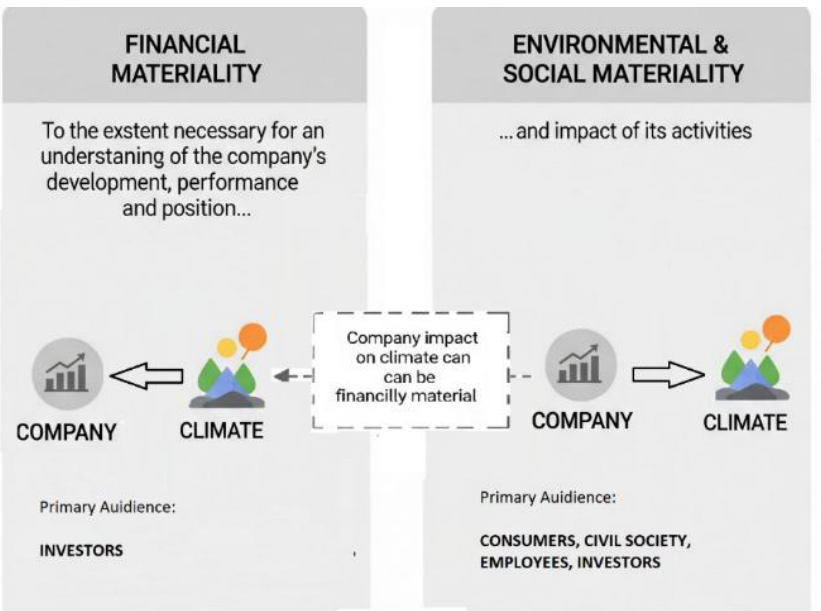


Figure 4-2 A visualization of the double materiality concept, with its two complementary dimensions.

Different sustainability reporting standards define and apply the concept of "materiality" in their unique ways. These differences not only guide the processes regarding which information companies should report but also directly affect the scope and nature of the information disclosed to the public. Below, the materiality concepts of the three main global standards are summarized:

The European Union, with the European Green Deal in 2019, adopted a more systematic and binding approach to sustainability reporting. Built on this approach, the ESRS clearly adopt double materiality, aiming to ensure that companies are responsible not only to their investors but also to society as a whole (EFRAG, 2023). Within this scope, employees, consumers, NGOs, and social partners are included as stakeholders in the reporting process. ESRS aims to provide a higher degree of homogeneity in reporting and to strengthen the link between financial and non-financial information (Baumüller & Sopp, 2021). Hence, this enables both investors and various segments of society to exercise their right to access the information they need. Furthermore, ESRS envisages that sustainability issues be treated not merely as a "reporting obligation" but as a strategic element of governance.

The ISSB's IFRS S1 and S2 standards follow a 'single materiality' model, often referred to as financial materiality. This approach considers environmental and social impacts only as they are directly reflected in the company's financial outcomes. While it offers a comparable and financially focused framework for capital markets, it also carries the risk of disregarding social and environmental impacts. The ISSB's reporting model is limited to financial impacts. Although the Board has stated that a full-scale double materiality approach could complicate the adoption of the standards, the fact that investors are increasingly giving more importance to both "inside-out" (impact-based) and "outside-in" (financial-based) sustainability disclosures shows that the distinction between these two perspectives is converging over time (International Sustainability Standards Board, 2023a, 2023b).

GRI standards, on the other hand, adopt a materiality approach based on the disclosure of significant economic, environmental, and social impacts that could influence user

decisions. This approach includes in the materiality assessment not only of the company's financial performance but also its positive or negative impacts on society, the environment, and other stakeholders. The GRI 3: Material Topics 2021 standard encourages organizations to comprehensively report their economic, environmental, and social impacts (GRI, 2021). GRI's multi-stakeholder model offers companies a framework to thoroughly assess and report their impact.

In conclusion, materiality has shifted from being a mere accounting measure to becoming a core part of how companies approach sustainability. These different approaches directly affect not only the content of reports but also the fundamental understanding of corporate sustainability. To clarify these differences visually, the key elements comparing the materiality approaches of the three main standards are presented in Table 4.1.

Table 4-1 A Comparison of the Materiality Approaches and Key Features of Three Sustainability Reporting Standards

Criterion	IFRS (ISSB)	ESRS (EFRAG)	GRI (Global Reporting Initiative)
Purpose	To provide comparable, reliable sustainability reporting for financial markets	To harmonize sustainability reporting within the EU and increase transparency	To enable organizations to disclose their social, environmental, and economic impacts
Materiality Approach	Single materiality (financial impacts only)	Double materiality (impact + financial materiality)	Double materiality (impact + financial materiality)
Core Standards	IFRS S1 (general), IFRS S2 (climate)	ESRS 1 (general requirements), ESRS 2 (general disclosures), 10 thematic standards	Universal, sector, and topic standards (GRI 101-400 series)
Content Pillars	Governance, Strategy, Risk Management, Metrics & Targets	Governance, Strategy, Impact-Risk-Opportunity Management, Metrics & Targets	Economic, environmental, and social performance topics

Mandatory Status	Depends on national regulation (Mandatory in Türkiye since 2024)	Mandatory for large entities in the EU since 2024, voluntary for others	Voluntary, but the most widely used framework globally
Area of Application	Global	EU and European-based businesses	Global
Interoperability	Works interoperable with GRI, SASB, CDSB, TCFD	Interoperable with GRI; ESRS 1 allows referencing other frameworks	Cooperates with ISSB; a complementary "building block" approach is adopted
Legal/Policy Link	Supported by International Organization of Securities Commissions (IOSCO); TCFD responsibility transferred to IFRS Foundation	CSRD (Corporate Sustainability Reporting Directive), EU Green Deal	Globally recognized as an independent standard-setter, does not create legal obligation

The most critical practical consequence of these differences is that companies may have to provide different levels of disclosure on the same topic for different standards. This situation further complicates the comparability of reports and leads to a situation where globally operating companies are forced to engage in dual reporting to simultaneously meet the expectations of both investors and regulatory bodies. Such a requirement significantly increases the cost and complexity of reporting processes.

As summarized in Table 4.1, the differences in materiality approach among sustainability reporting frameworks are not limited to a methodological dimension; they also play a decisive role at the normative and strategic levels. These differences directly shape how businesses formulate their sustainability strategies, the communication methods they establish with stakeholders, and which topics they prioritize in their reporting processes.

Nevertheless, how these approaches actually work in practice is an area that needs to be studied more closely. Which information companies choose to disclose and the extent to which these choices provide transparency are at the center of current debates on sustainability reporting. The subjective nature of materiality

analyses, in particular, creates fertile grounds for misuse in voluntary reporting systems, allowing companies, out of concern for their corporate reputation, to highlight only positive information while excluding negative information from their scope. This situation directly contributes to an increased risk of misleading narratives about sustainability performance; that is, “greenwashing”.

4.2.The Strategic Misuse of Materiality: The Greenwashing Phenomenon

In sustainability reporting, the concept of materiality should be regarded as more than a mere technical tool for determining which information to share; it is one of the fundamental indicators of corporate transparency and ethical responsibility. At the same time, because the concept is open to interpretation, lacks standardization in practice, and isn’t backed by strong oversight, it carries serious risks. Foremost among these risks is the tendency of companies to present their environmental and social performance more favorably than it truly is, thereby shaping stakeholder perception, a practice commonly referred to as greenwashing.

When materiality analysis is stretched in this manner, it opens a door to greenwashing and directly undermines the credibility of reporting. This structural problem threatens not only the marketing strategies of companies but also the integrity of sustainability reporting standards and the trust placed in them by stakeholders.

The flexibility and lack of standardization in materiality analysis are seen to lay fertile ground for one of the biggest ethical problems in sustainability reporting: the risk of greenwashing. This is directly related to companies highlighting areas where they are strong as material while diverting attention from areas where they are weak by labeling them immaterial. In the literature, the corporate motives and psychological drivers behind this behavior are often described using the so-called Greenwashing Triangle model (Kurpierz & Smith, 2020). However, this model has been criticized for insufficiently reflecting the cultural and regulatory contexts of developing countries, leading to calls for the development of sector-

specific typologies. The key components of the Greenwashing Triangle can be summarized as follows:

- Pressure: As ESG demands from investors, customers, and regulators grow, companies come under pressure to present themselves as doing well in sustainability. This pressure can trigger approaches that focus merely on image correction rather than genuine transformation.
- Opportunity: Because reporting standards have gaps, materiality is subjective, and oversight is weak, companies sometimes get the chance to mask poor results or overstate their performance.
- Rationalization: Management echelons may legitimize this misleading behavior with justifications such as, it's just marketing, everyone is doing it, or a little exaggeration won't hurt.

These drivers may push companies toward projecting a sustainable image rather than truly investing in sustainability (Delmas & Burbano, 2011). On top of that, managers' personal cognitive biases can also feed into and reinforce this tendency. For instance, optimism bias can lead managers to downplay their firm's environmental impacts and exaggerate its positive progress. Even without deliberate intent to deceive, this can still lead to reporting practices that misinform stakeholders.

Greenwashing should be considered not just a communication problem, but a critical phenomenon that distorts market mechanisms. This is because misleading or exaggerated sustainability claims lead to the misallocation of capital. As a result, financing may flow to firms that project a green image but perform poorly on ESG metrics, while companies with authentic sustainability initiatives are neglected. This causes unfair competition and blocks markets from channeling capital efficiently toward building a sustainable future (Lyon & Montgomery, 2015).

Greenwashing doesn't just erode stakeholder trust, it also increases the risk of market failure on a larger scale.

Greenwashing is a deceptive communication practice that occurs when companies or public institutions present their products and services as environmentally friendly while, in reality, they have negative environmental impacts (Demirci, 2021; Moodaley & Telukdarie, 2023). The term was first coined in 1986 by environmental activist Jay Westerveld, who revealed that the hotel industry's promotion of towel reuse as an environmental conservation initiative was, in fact, aimed at reducing costs (Free et al., 2024). From this first example to the present day, greenwashing methods have evolved from simple communication strategies into multi-layered financial and operational plans. With ESG funds on the rise, digital media shaping perceptions, and sustainability rules multiplying, these strategies have grown far more complex and sophisticated. In this context, selectivity in deciding which information to disclose in materiality assessments can contribute to the formation of claims that lack a verifiable basis.

Greenwashing is not just a private-sector issue, governments, regulators, research bodies, international organizations, financial players, and even NGOs can also fall into these practices (Nemes et al., 2022). Indeed, some researchers stress that unclear materiality criteria give companies room to exploit them for their own interests, which damages the credibility of reports (Adams & Evans, 2004; Farooq & De Villiers, 2017; Sulkowski, 2024).

As highlighted by Mio and colleagues, determining the objective materiality levels of non-financial sustainability issues is a much more complex process compared to financial reporting. This challenge is further intensified by sectoral differences, the diversity of business activities, and the influence of regional contexts (Mio et al., 2020). In the specific context of Türkiye, an empirical study on Borsa Istanbul (BIST) companies revealed that businesses exhibit a formal approach rather than a systematic methodology in their materiality analyses (Özata Canlı & Serçemeli, 2024). It only adds to the danger of greenwashing.

Researchers have developed different typologies to classify greenwashing in the literature (de Freitas Netto et al., 2020; Delmas

& Burbano, 2011; Nemes et al., 2022; Yang et al., 2020; Zioło et al., 2024). The most fundamental distinction is between greenwashing practices at the corporate level and those at the product/service level. Corporate level greenwashing creates an image of environmental sensitivity through the company's overall reputation, while product level greenwashing involves misleading or distorted information about the environmental features of a specific product. The framework developed by Torelli and colleagues examines this phenomenon at the corporate, strategic, and product levels (Torelli et al., 2019). At the corporate level, misleading messages appear through elements such as logos, certifications, or inconsistencies in corporate communications, while at the strategic level, greenwashing involves inaccurate or incomplete disclosures regarding long term goals or environmental commitments.

A more widely known classification of greenwashing is the Seven Sins of Greenwashing model developed by TerraChoice (Dimitrieska et al., 2017). This model aims to systematically analyze different types of false statements by identifying the basic categories of misleading environmental claims. The sins are summarized as follows:

i. **Sin of Hidden Trade-off:** Promoting one positive environmental feature while ignoring or hiding the negative ones.
ii. **Sin of No Proof:** Making claims that lack verifiable evidence.
iii. **Sin of Vagueness:** The use of ambiguous terms like eco-friendly.
iv. **Sin of Irrelevance:** Attempting to attract attention with environmental information that is true but unimportant.
v. **Sin of Lesser of Two Evils:** Presenting relatively less harmful options as if they are environmentally friendly.
vi. **Sin of Fibbing:** Making outright fictitious environmental claims.

Scanlan added six more sins to this list, focusing particularly on the fossil fuel industry, including creating false hope, fear-

mongering, broken promises, injustice, concealing dangerous consequences, and profit-driven environmental negligence (Scanlan, 2017).

While the TerraChoice model provides a framework primarily for categorizing misleading environmental claims used in consumer-focused marketing discourse, the typology developed by Yang and colleagues offers a complementary perspective that functions in the context of corporate strategies and reporting practices (Yang et al., 2020). When it comes to reporting standards and audits, the Yang typology works as a useful corporate-level tool and provides a more comprehensive way of analyzing risks. Yang and colleagues break greenwashing down into six main categories, showing how companies use deceptive tactics in their sustainability messaging. The first one, called selective disclosure, is when companies share only favorable environmental data and hide the negative effects. The second category, decoupling, refers to the gap between a company's green promises and the reality of what it actually does. The third, attention deflection, seeks to distract stakeholders from real environmental problems by emphasizing minor or irrelevant disclosures. The fourth, deceptive manipulation is a strategy to create a positive environmental image using deliberately misleading rhetoric and visual elements. The fifth, dubious authorizations and labels, lead to the deception of consumers with environmental labels that are not open to audit or are unreliable. Finally, inefficient public voluntary programs cover programs that companies join merely to create an appearance of sustainability without offering any real environmental contribution (Yang et al., 2020). These six categories provide an important analytical framework for understanding which information companies highlight and which they systematically leave in the background in their sustainability communications. Such classifications concretely reveal the different mechanisms and methods that companies resort to when implementing greenwashing strategies.

Chief among these mechanisms is the strategic manipulation of the language and visual elements used in reports. Companies lean on fuzzy labels like eco-friendly, green, or sustainable terms that

sound nice but are often weak and open to interpretation. Another common mechanism is selective reporting, where companies share the good news but quietly leave the bad news out. For example, a company may proudly report lowering its carbon footprint while keeping quiet about rising water use or waste in the same period. Additionally, certifications and labels that are not credible or are created on the company's own initiative are another significant greenwashing strategy that allows for the misuse of voluntary standards.

These theoretical frameworks become clearer when evaluated through the lens of concrete corporate cases that have resonated globally. In this context, the Dieselgate scandal that emerged at Volkswagen in 2015 is one of the most striking examples of what is defined in literature as the Sin of Fibbing. The company, thanks to special software used in its diesel vehicles, made its cars appear much cleaner in emissions tests; however, it was revealed that in normal use, their NOx emissions at up to 40 times the federal maximum on the road (Mačaitytė & Virbašiūtė, 2018). This event exposed the deliberate and deep inconsistency, that is, the state of decoupling between the company's public marketing discourse and its technical engineering practices. The scandal left Volkswagen with billions in fines, a steep fall in stock value, and lasting damage to its reputation.

In fast fashion, greenwashing appears in subtler ways. Take H&M's Conscious collections, advertised for their use of recycled materials. However, critics point out that these collections represent only a small fraction of the massive environmental and social impacts created by the company's overall buy-use-dispose business model (Alexa et al., 2022). This situation is an example of the strategy called the Sin of the Hidden Trade-off; that is, a minor positive attribute is exaggerated to mask the general unsustainability of the business model.

Both cases are critically important for demonstrating how greenwashing can take very different forms. Volkswagen is an example of outright illegal deception, while H&M shows a subtler strategy one that stays within the law but hides an unsustainable business model. This contrast demonstrates how hard it can be for

stakeholders and regulators to detect misleading statements. Furthermore, both cases show how materiality analysis can be manipulated in favor of companies.

Therefore, greenwashing should be seen not as an issue concerning the reputation of individual companies, but as a systemic problem that threatens the entire credibility of sustainability reporting. At this point, the main types of greenwashing defined in the literature and the prevention strategies developed against them are summarized comparatively in Table 4.2.

Table 4-2 Greenwashing Types and Prevention Strategies

Greenwashing Type	Definition / Characteristics	Typical Examples	Prevention Strategies
Hidden Trade-off	Highlighting a single environmental benefit while concealing other negative impacts.	Emphasis on recycled material, concealment of general fast fashion impacts.	Reporting on entire value chain impacts, third-party verification.
Selective Disclosure	Hiding negative information, sharing only positive data.	Reporting a decrease in carbon emissions while concealing an increase in water consumption.	Double materiality approach, comprehensive performance metrics.
Decoupling	Inconsistency between rhetoric and actual practices.	Pledging net-zero while directing investments to fossil fuels.	Independent audit, traceability of commitment to action.
Deceptive Manipulation	Creating a perception of being eco-friendly with misleading language or visuals.	Nature-friendly labels with no verifiable data.	Evidence-based reporting, credible certifications.
Dubious Labels	Using environmental labels with low credibility or that are fake.	Uncertified eco logos.	Independent accreditation, transparent label standards.
Inefficient Voluntary Programs	Superficial initiatives with no real environmental contribution.	Symbolic carbon offsetting campaigns.	Independent evaluation mechanisms that measure the impact of programs.

The types of greenwashing and the prevention strategies summarized in Table 4.2 clearly show that not only communication standards, but also corporate governance mechanisms play a critical role in this process. Greenwashing practices are not merely a temporary stain on a company's reputation; they are a phenomenon with much deeper and more destructive consequences. These consequences have a wide range of impacts, extending from stakeholder relations to financial performance, and from legal liabilities to market position.

The most fundamental consequence is the erosion of stakeholder trust. When consumers feel misled, they may boycott the brand or stop being loyal, while employees could lose motivation or walk away if they feel the company’s values don’t match their own. For investors, greenwashing is a clear warning sign that the company can’t be trusted to manage risks or govern responsibly. This situation can lead to ESG-focused investment funds divesting from the company or to sudden and dramatic drops in the company's stock value (Christensen et al., 2021).

In addition to the loss of trust, it is observed that legal and reputational risks are also increasing. Today, in many parts of the world, consumer protection authorities and regulatory bodies are meticulously investigating misleading environmental claims, and a new legal field known as “greenwashing litigation” is emerging. Companies can face billions of dollars in fines and compensation lawsuits due to such misleading advertisements and reports. While the emission scandal is one of the most well-known examples in this context, similar lawsuits are now being seen in many sectors such as food, energy, finance, and fashion. These legal risks inflict hard-to-repair damage on companies' brand value and corporate reputation, seriously threatening their long-term competitive advantage.

Therefore, the prevention of greenwashing should be considered not only an ethical requirement but also a strategic necessity for the long-term financial sustainability of companies. At this point, new regulations such as the European Union's “green claims” legislation and innovative technologies like blockchain-based supply chain traceability systems will play a critical role in mitigating the risk of greenwashing in the future.

4.3. The Different Faces of Washing and Corporate Defense Mechanisms

Greenwashing is now a growing concern, attracting attention not just from scholars but also from regulators, practitioners, and the public. Deceptive communication isn't just about environmental issues, it also shows up in the social and governance domains. Researchers especially highlight two concepts:

- **Social Washing:** This happens when firms look away from serious social problems, like unfair wages or labor rights abuses in their supply chains, and instead showcase token projects such as a school donation or diversity policy to look socially responsible (Pope & Wæraas, 2016).

- **Blue Washing:** Firms try to look legitimate by joining the UN Global Compact or showing support for the SDGs, but they avoid taking real action to put those principles into practice (Berliner & Prakash, 2015).

The growing sophistication of these types of washing has made it imperative for stakeholders and regulators to develop new methods of detection and prevention to test the veracity of these claims. Consequently, at the practical level, multi-dimensional strategies are beginning to be formed to combat these manipulative practices (Demirci, 2021; Free et al., 2024; Kurpierz & Smith, 2020; Moodaley & Telukdarie, 2023; Yang et al., 2020; Zioło et al., 2024). These corporate defense mechanisms can be classified along four main axes, exhibiting a multi-layered structure: internal strategies, market-based verification mechanisms, regulatory and societal oversight, and technological tools.

The first step in tackling the issue starts with a company's in-house strategies. Another crucial way to fight greenwashing is through reporting that's both transparent and consistent. In this regard, strong internal controls and systems based on standards contribute to preventing misleading statements. However, transparency alone may not be sufficient to prevent social harm. Environmental research and development spending is another clear

sign that a firm is putting money into real technologies with environmental benefits, not just symbolic green gestures.

The second layer consists of market-based verification mechanisms. Chief among these tools are sustainability assurance services (third-party audits). These services increase investor confidence and reduce the risk of greenwashing by having a company's environmental claims verified through an independent audit. Another market-based tool aimed at consumers is the eco-label system, which requires independent boards to prevent misuse and aims to provide credible information.

The third layer involves regulatory and public oversight mechanisms. In places like the UK, EU, US, and Australia, stronger laws and oversight with special units monitoring green claims and tighter penalties are making these practices more costly and risky. At a global level, organizations like the ISSB also contribute to the institutionalization of this process by shaping reporting standards. Public pressure and stakeholder involvement serve as a kind of social control, pushing companies to act more ethically and transparently. Additionally, media and communication oversight is also key, both for stopping greenwashed ads and for making sure the public gets accurate information.

On top of this, technology is becoming an important tool to strengthen these oversight systems. In particular, technological methods such as AI, machine learning (ML), and natural language processing (NLP) have the potential to automatically analyze the claims in sustainability reports and to detect indicators of greenwashing such as no proof or vagueness. For example, NLP algorithms can identify non-scientific phrases like eco-friendly in report texts, thereby exposing selective reporting or manipulative rhetoric (Moodaley & Telukdarie, 2023). Despite their benefits, these technologies present significant risks, including algorithmic bias, poor data quality, and a lack of ethical transparency (Korga & Aslanoğlu, 2024). Therefore, more research is needed to make these technologies more effective and to set clear rules for their ethical use.

The ultimate goal of all these defense mechanisms is to combat the fundamental elements of the Greenwashing Triangle. This model shows how pressure, opportunity, and rationalization

shape the conditions that give rise to greenwashing. The criminal sanctions, audit processes, and ethical awareness mechanisms mentioned above aim to reduce these very elements (Kurpierz & Smith, 2020).

In conclusion, the uncertainty in the concept of materiality and the prevalence of greenwashing emerges as a serious problem that severely undermines the credibility of sustainability reporting and corporate accountability. To cope with this situation, it is not enough to adhere solely to technical standards; it is necessary to establish a strong ethical corporate culture, implement strict regulatory oversight, and institutionalize stakeholder participation. By using these approaches, creating clear and verifiable criteria will both raise the quality of reporting and make sustainability claims more trustworthy. Moving forward from this point, the next chapter address the role that the concept of materiality will assume in the future at the intersection of strategic transparency and technological accountability, and how its potential transformation might unfold.

4.4.From Strategic Transparency to Technological Accountability

As this chapter has demonstrated, the concept of materiality is both the most powerful strategic tool and the most fragile link in sustainability reporting. When applied correctly and ethically, it enables companies to focus on their most critical ESG issues, use their resources efficiently, and build a more meaningful, trust-based dialogue with their stakeholders. But like any powerful tool, this idea can be used for good or for bad. In the wrong hands, it can be twisted from a tool for transparency into a weapon that actually helps companies hide the truth and get away with greenwashing. Because this idea can be used honestly or dishonestly, there's always a danger that we can't trust what companies are reporting. This is exactly why we need to improve the rules, both voluntary and mandatory, and create better ways to check if everyone is playing fair.

In a forward-looking perspective, the transformative role of technology in resolving this dilemma is becoming increasingly apparent. AI, ML, and natural language processing (NLP) algorithms possess the capacity to analyze thousands of sustainability reports to

detect vague phrases like “eco-friendly”, unproven claims, or critical issues that are systematically ignored (Moodaley & Telukdarie, 2023). These tools not only serve to verify past data but also have the potential to enhance transparency by offering preventative and corrective recommendations to companies in future reporting cycles.

In addition, blockchain technology enables the journey of products and materials in supply chains, from their source to the end consumer, to be immutably recorded, allowing for materiality assessments that are more objective, transparent, and data-driven (Sulkowski, 2024). This approach not only strengthens the verifiability of reports but also offers a solid foundation for rebuilding stakeholder trust. In the future, with the integration of these technologies into initiatives such as the EU's “green claims” legislation and the digital product passport, the implementation of automated, real-time verification systems may become possible.

At this point, three critical areas of focus emerge for policymakers, academics, and practitioners:

- *Strengthening Ethical Frameworks:* The regulation of principles for algorithmic transparency, data privacy, and stakeholder representation in parallel with the process of technology integration.
- *Inter-Standard Alignment:* We need to get all the major rule-makers (like the EU, IFRS, and GRI) on the same page. They should agree on an identical way to measure what’s truly important and a clear process for checking if company reports are accurate.
- *Participatory Audit Models:* Building stronger oversight by building a broader stakeholder base including NGOs, academia, and investors.

The bottom line is that focusing on what “material” remains a double-edged sword. It can either force companies to be reliable about what really matters, or it can give them the perfect excuse to ignore the challenging issues. However, it is possible to narrow the scope for its subjective interpretation and transform it into a genuine tool for strategic transparency. When technology-assisted

verification systems, strong ethical norms, and strict regulatory frameworks converge, sustainability reporting can become a major catalyst not only for corporate accountability but also for the global sustainability transition.

At this juncture, having moved beyond the debates on greenwashing and materiality, it is now necessary to address the strategic transformations, technological tools, and new governance paradigms that will shape the future of sustainability. The following chapter will focus on the corporate sustainability vision that charts the horizon of this transformation.

5. THE FUTURE OF CORPORATE SUSTAINABILITY: STRATEGIC HORIZONS AND GOVERNANCE

As discussed in detail in the preceding chapters, the concept of corporate sustainability, drawing from its historical origins and theoretical foundations, has settled at the center of the modern business world, transforming into a multi-dimensional and dynamic structure. The evolution of reporting standards from voluntary practices to mandatory obligations has increasingly steered companies toward the principle of transparency. At the same time, the ethical debates that have developed around concepts like materiality and greenwashing during this process have clearly exposed the fragility of that very transparency.

At this point, the corporate sustainability discourse is no longer confined to technical questions such as "whether to report" or "which standard to adopt". The primary focus is now shifting to a much more fundamental and strategic question: What must the successful and resilient business of the future look like?

This final chapter aims to answer precisely this question, comprehensively addressing the strategic horizons and new governance paradigms that will shape the future of the corporate sustainability field. The issue is no longer merely about reporting on past performance; it is about proactively anticipating and managing the risks and opportunities of the future. In this context, this chapter will move from the current standardization problems in reporting to conduct an in-depth analysis of the technological innovations that offer potential solutions, the green finance dynamics that are redefining capital markets, the circular and sustainable business models that transcend the linear economy, and the next-generation corporate governance approaches that will be required to manage this entire transformation.

The objective is not simply to present the reader with a snapshot describing the current state of affairs, but to forge a visionary roadmap for the sustainable business world of the future.

5.1. The Standardization Problem in Reporting Practices and Forward-Looking Solutions

As emphasized in the preceding chapters, one of the greatest structural challenges facing sustainability reporting is the problem of standardization. Companies operating on a global scale are often compelled to comply simultaneously with multiple reporting standards (for example, IFRS S1–S2 and ESRS) that are not fully compatible with one another. This situation creates a significant burden in terms of both content and format, further deepening the standardization problem. The best way to understand the difference between GRI and ISSB is by looking at two main distinctions: who they believe the report is for, and what information they require companies to disclose. For GRI, what matters is any significant impact a company has on the world, and that information is for everybody. For ISSB, what matters is anything that could affect a company's financial performance, and that information is primarily for investors These methodological divergences directly affect data structures and measurement criteria, exacerbating the problem of comparability.

One of the areas where the standardization problem is most acutely felt is in the indicators used in reports. For example, while a company's "carbon footprint" data might be reported under ISSB only in the context of its financial impacts, the ESRS framework expects this data to be detailed in the context of Scope 1, 2, and 3 emissions, reduction strategies, transition risks, and long-term targets. This difference creates a dual burden on the data collection infrastructure and internal audit processes of multinational corporations, while generating significant administrative costs for SMEs. Similar problems are observed in the case of Türkiye. Although the compatibility of the TSRS with ESRS is an important step, problems persist in practice regarding data integrity, digital integration, and the standardization of reporting processes (Şahin et al., 2018).

Similarly, the use of different methodologies by ESG rating agencies causes the sustainability performance of companies to be scored inconsistently by different organizations. This situation leads to a problem of trust in the markets and creates information

asymmetry when the same company is assessed at different risk levels by different ESG organizations. In such an environment, the reliability of reports is weakened, laying fertile ground for an increased risk of greenwashing.

The proposed solutions to these problems are multi-dimensional. Firstly, the development of global interoperability matrices can help minimize existing differences by building conceptual bridges between systems like GRI, ISSB, and ESRS. Furthermore, it's now more important than ever for companies to master the use of digital tools if they want to stay competitive. First, it is important to create common reporting language for company data with standardized digital tags to easily compare different reports. Second, projects like the EU's new Single Access Point are building centralized public databases to store all this information, making it possible to analyze it all on a macro scale. The adoption of XBRL-based ESG classifications could further enhance comparability and interoperability across different reporting frameworks.

Furthermore, the creation of sectoral benchmarks is also important for strengthening comparability. Defining minimum indicators and materiality thresholds for each sector will make company-to-company comparisons more objective and will reduce the risk of greenwashing. In the specific case of Türkiye, guidance documents developed to make TSRS applications more consistent on the ground will play a critical role. These guides will provide direction for small businesses while also clarifying the obligations of large-scale companies. Moreover, the success of the transformation process is directly dependent on the quality of human capital. To ensure the widespread and correct implementation of TSRS, it is necessary to increase sector-level reporting training and to establish stronger collaborations among the public sector, the private sector, and universities.

In conclusion, the simultaneous existence of multiple standards in sustainability reporting makes the practices in this field more complex, costly, and time-consuming. However, the effective use of technological tools, harmonization at the indicator level, and the development of clear, practical, and inclusive guidance

mechanisms for practitioners will make it possible for this multi-layered structure to be adapted at the corporate level. In this way, sustainability reporting will move beyond being merely a legal obligation to become an inseparable component of companies' long-term corporate strategies.

In the context of Türkiye, the alignment of TSRS with the European Union's ESRS standard is considered a significant step forward for global integration. The real struggle, however, begins when companies try to put this plan into practice. In application three major setbacks: unreliable data, inadequate digital infrastructure and lack of proficient personnel severely limit reliability and comparability of reporting. Ultimately, this chapter provides a set of tools and strategies that can guide Türkiye on its journey toward sustainability, helping it navigate the complex challenges and opportunities ahead. Europe's new single data platform, European Single Access Point (ESAP) and the rise of AI-powered auditing could serve as a blueprint for Türkiye. Adopting these technologies would help solve the country's current challenge of getting its various digital systems to work together smoothly. Additionally, global investment trends such as green capital and impact investing create significant opportunities for Turkish companies that can prove their sustainability performance with transparent and reliable data. The foundation of this transformation will be capacity-building programs and practical training tailored to sectoral needs, strengthened by collaboration among the public, private, and academic sectors.

5.2.Strategic Transformations Shaping the Future

The future of sustainability reporting is being redefined by technology-focused solutions aimed at the prevailing challenges of standardization and data reliability. Companies operating on a global scale are forced to comply simultaneously with reporting standards, such as IFRS S1–S2 and ESRS, that are not fully compatible with one another. This situation imposes an increasing reporting burden on companies in terms of both content and form. As a result, businesses' operational costs rise, while stakeholder trust erodes and uncertainty in investment decisions grows. For example, while a

company's carbon footprint data is reported under the ISSB framework in a manner limited to its financial impacts, the ESRS standard mandates that the same data be disclosed in a more detailed context that includes Scope 1, 2, and 3 emissions. Similarly, the use of different methodologies by ESG rating agencies leads to the emergence of conflicting assessments of sustainability performance and weakens market credibility.

Over the last decade, corporate sustainability reporting has evolved from being a nice-to-have, for companies wanting to look transparent to a must-have, that's now a core part of business strategy and the new rules of the global economy. This transformation has profoundly changed companies' relationships with their investors and expectations of broader stakeholder community. Eventually, this study has looked at sustainability reporting from both ends: we've explored its past and carefully analyzed its future. The goal was to understand not just where it came from, but where it's going and how it will shape the way companies are run.

In this chapter, four fundamental areas shaping the future of sustainability reporting have been addressed. Technologies like artificial intelligence, blockchain, and the Internet of Things (IoT) play a transformative role in sustainability reporting by improving data quality, transparency, verifiability, and standardization. Subsequently, financial instruments such as green capital and impact investing are redefining investment paradigms and incentivizing sustainability-focused investments. Additionally, the increasing alignment of global regulations is driving the harmonization of standards, aiming both to alleviate the reporting burden on companies and to strengthen stakeholder trust. Conclusively, the shift from stakeholder focused mentality toward circular economy is accelerating the evolution of companies toward a more sustainable and comprehensive framework.

A synthesis of these trends reveals an extensive transformation, one that is reshaping the internal operations of companies, the architecture of global governance, and the landscape of stakeholder expectations. Navigating this new reality therefore requires a holistic perspective that integrates the complex interplay

of strategic imperatives, technological advancements, and evolving ethical standards.

5.2.1. Technology- and Data-Driven Sustainability Management

The shortcomings in the reliability and comparability of sustainability data create a significant “credibility gap” in the eyes of stakeholders. In closing this credibility gap and overcoming the problems of standardization, the transformative power of technology is being identified as a factor that is reshaping the future of sustainability management. Innovative technologies such as artificial intelligence, blockchain, and the IoT, with their data-driven approaches, have begun to play a critical role in helping companies make their reporting processes more transparent, verifiable, and efficient.

AI-powered analyses have the potential to evaluate thousands of sustainability reports to identify greenwashing signals, inconsistencies in reports, or practices of selective reporting. Natural Language Processing (NLP) methods are being developed for the purpose of detecting misleading or vague phrases in companies' communication materials (Samoggia et al., 2025). However, one of the biggest challenges in this area is the lack of large, labeled datasets containing both “greenwashed” and “non-greenwashed” statements. Moreover, AI-driven predictive analytics and automated ESG scoring systems are being piloted to benchmark companies against industry peers, helping investors and regulators assess risks more effectively. Furthermore, emerging automated systems have the potential to analyze vast datasets to more objectively identify a company's most critical ESG issues. This data-driven approach promises a dual benefit: enhancing the credibility of the final report while simultaneously streamlining the audit process. (Sulkowski, 2024).

One of the weakest links in sustainability management is ensuring transparency and traceability in supply chains. Blockchain technology offers a radical solution to this problem by recording a product's journey from raw material to the final consumer in an immutable and transparent manner. It strengthens stakeholder trust

by making it possible to verify claims on issues such as fair trade, organic certification, or the prevention of child labor (Kshetri, 2021). Real-world applications already demonstrate this potential. Major examples include the use of digital tracking to prevent the blood diamond trade and the formation of blockchain consortia to guarantee product authenticity and ensure supply chain transparency. (Dilmegani & Ermut, 2025). In addition, smart contracts have the potential to automate compliance tasks or even trigger the issuance of verified carbon credits once specific sustainability thresholds are achieved.

Another key driver of this transformation is the European Commission's ESAP initiative, aiming to centralize corporate data into a single, publicly accessible repository. With its first phase set to go live in 2027, ESAP aims to have all companies submit their financial and sustainability data on a single digital platform in a machine-readable format. This approach will make data easier to analyze, thereby increasing comparability and reducing the methodological confusion created by ESG rating agencies (European Parliament and Council, 2023).

IoT and remote sensing equipment are transforming data collection into an automated and real-time operation. Technologies like smart sensors and satellites can now continuously monitor critical environmental impacts, such as local emissions or deforestation, providing a constant and objective record of performance without direct human input. (Kamilaris & Ostermann, 2018). Remote sensing technologies complement IoT by providing macro-level monitoring of agricultural activity, land use, and biodiversity, thereby extending traceability beyond the factory or supply-chain level. By providing accurate, verifiable, and independent third-party data, these technologies are crucial for building stakeholder trust. For instance, agricultural giant Cargill. now uses satellite monitoring to detect deforestation in its vast soy, palm oil, and cocoa supply chains almost as it happens, offering a new level of transparency.(Cargill, 2025). Similarly, IoT sensors and AI-powered warning systems are improving water management performance by monitoring water quality and usage instantaneously (SLB, 2025). Beyond AI, blockchain, and IoT, emerging

technologies such as digital twins, NLP-based content analysis, standardized reporting taxonomies (e.g., XBRL), and stakeholder engagement platforms are also beginning to shape more reliable and inclusive sustainability reporting.

Table 5-1 provides a detailed overview of significant sustainability technologies, summarizing their practical applications, key benefits, and associated risks.

Table 5-1 Technological Enablers for Corporate Sustainability: Applications, Benefits, and Challenges

Technology	Primary Applications	Documented Benefits	Critical Challenges / Risks
Artificial Intelligence & Data Analytics	Greenwashing detection, materiality analysis automation, ESG data verification, risk modeling, automated ESG scoring	Increasing reporting accuracy and efficiency, revealing hidden risks and opportunities, strengthening audit processes	Algorithmic bias, lack of transparency (the "black box" problem), high implementation costs, lack of sufficient training data
Blockchain & Smart Contracts	Supply chain traceability, product origin verification, compliance automation, automated carbon credit issuance	Increasing transparency and data integrity, preventing forgery and fraud, strengthening stakeholder trust	Scalability issues, high energy consumption (on some platforms), integration difficulties with existing systems, lack of standards
Internet of Things & Remote Sensing (Satellites)	Real-time monitoring of emissions, water, and energy consumption; deforestation detection; waste management	Increasing data accuracy and reliability, reducing the need for manual data collection, enabling proactive risk management	Data privacy and cybersecurity risks, high initial investment, maintenance and calibration of sensors, data standardization

Digital Twin & Simulation Platforms	Virtual modeling of factories, supply chains, and energy systems; scenario testing for emissions reduction and circular economy strategies	Predictive assessment of risks and opportunities, cost reduction through simulation, optimizing sustainability strategies before implementation	High development costs, complexity of integration, need for specialized expertise
Natural Language Processing (NLP)	Automated scanning of sustainability reports and communications to detect greenwashing, vague claims, or inconsistencies	Strengthens credibility of reporting, increases audit efficiency, reduces manual effort in content analysis	Requires large labeled datasets, risk of false positives/negatives, ethical concerns in automated text analysis
Data Standardization & XBRL Taxonomies	Harmonization of ESG data formats across standards (GRI, ISSB, ESRS, TSRS); machine-readable reporting	Improves comparability across firms and industries, reduces compliance costs, facilitates digital integration (e.g., ESAP)	Fragmentation of taxonomies, need for regulatory alignment, technical training needs
Stakeholder Engagement Platforms (Crowdsourcing)	Collecting stakeholder input (employees, communities, consumers) on ESG issues through digital platforms	Enhances inclusivity and legitimacy of reporting, increases stakeholder trust, provides qualitative insights beyond KPIs	Risk of biased or unrepresentative participation, data privacy concerns, moderation challenges

The effects of technological transformation are not limited to increasing data transparency; they are also redefining the direction of capital flows and investment priorities. Therefore, the next

subsection will discuss in detail the strategic role of green capital and impact investing in this transformation.

Impact investing operates on the principle of "profit with a purpose". It actively channels capital into companies and projects that can deliver a measurable benefit to society or the environment, while still providing a solid financial return. This approach is a key tool for unlocking the private sector's potential to contribute to sustainable development goals.

5.2.2. The New Paradigm in Finance: Green Capital and Impact Investing

One of the most important dynamics shaping the future of sustainability is a profound shift in the world of finance. Capital is no longer solely a tool for generating financial profit but is now increasingly a lever for creating measurable social and environmental goods. This green transformation in finance is creating a powerful ripple effect across the entire economy. It is not only reshaping the decision-making of investors but also compelling corporations to fundamentally rethink their business models, re-evaluate their risks, and realign their strategic priorities.

- *Green Finance and Impact Investing:* The traditional ESG investment approach, that is, the negative screening strategy based on avoiding companies with high environmental and social risks, is increasingly giving way to impact investing. Impact investors do not just minimize risks; they actively direct capital to projects that create a direct positive impact on society and the environment. The impact investing market is experiencing explosive growth, projected to expand from an estimated 377 billion USD in 2024 to over 1.1 trillion USD by 2034 (Market.Us, 2025). This transformation is being put into practice by a new generation of financial instruments. Tools such as green bonds, social bonds, and sustainability-linked loans are critical for mobilizing capital and directing it toward specific environmental and social objectives (Ehlers & Packer, 2017). The momentum behind

sustainable finance is accelerating rapidly. In 2024 alone, global sustainable bond issuances hit an unprecedented 1.05 trillion USD, a surge of 31% over the previous year. (Muldoon et al., 2025). However, as the market matures, the advantage that allows green bonds to borrow at a lower cost, an advantage known in the literature as the greenium, is gradually diminishing, especially in emerging markets, as supply begins to catch up with demand (IFC and Amundi, 2025). This development indicates that investors are now focusing not just on the "green" label, but on the verifiable and measurable impacts of the projects. Consequently, in the future, the capital costs for companies with poor sustainability performance will rise, while their access to capital will become progressively more difficult.

- *The Integration of Climate Risks into the Financial System:* This financial transformation is two-sided. While driven by new opportunities, it is also shaped by the urgent need to manage the systemic risk that climate change poses to the global economy. Acknowledging this threat, central banks and regulators are now compelling financial institutions to price these climate risks directly onto their institutional balance sheets. Network for Greening the Financial System (NGFS) has developed scenarios that have become a global benchmark for presenting climate risks. The most current modeling from the NGFS, using updated "damage functions", projects that if current policies are maintained, the global Gross Domestic Product could face losses of up to 30% by 2100, a figure that is more than double previous projections (Green Central Banking, 2025). The European Central Bank exemplifies this shift, requiring that as of 2025, banks and insurance companies must conduct climate-related stress tests and incorporate both physical and transition risks

into their balance sheets (Banque de France, 2025). This development is compelling the financial sector to prioritize the climate factor in its capital allocation decisions.

This fundamental re-routing of global capital has triggered a domino effect, forcing an evolution in both investment strategies and the regulatory systems that govern them. At the heart of this regulatory evolution are the ongoing efforts to harmonize the major global standards, notably the ISSB and ESRS. In this context, the reshaping of financial paradigms is profoundly affecting not only capital allocation mechanisms but also the regulatory policies that will determine the future of sustainability reporting. Therefore, the next section will discuss how these regulations will evolve in the future and what role they will play in global sustainability governance.

5.2.3. The Future of Regulation and Global Alignment

As discussed in detail in the preceding chapters, the dynamic that can be described as the "standards war" will continue to be one of the most critical agenda items for corporate sustainability in the coming years. In this arena, two main scenarios stand out: a "convergence and global alignment scenario" and a "divergence and regionalization scenario". Under the Convergence and Global Alignment Scenario, efforts toward "interoperability" between the major standard-setting bodies, such as the ISSB and ESRS, are seen to be gaining momentum. Indeed, EFRAG and the IFRS Foundation have announced that a "very high degree of alignment" has been achieved, particularly in the area of climate reporting (ESRS E1 and IFRS S2), and have published joint guidance aimed at reducing the duplicate reporting burden on companies (EFRAG-ISSB, 2024). This development is creating a common "global baseline" of core indicators that can be used by companies complying with different standards, a move that reduces the reporting burden while simultaneously increasing comparability.

The Divergence and Regionalization Scenario, on the other hand, comes to the fore if geopolitical competition and differing economic models persist. In this scenario, the most fundamental

division is shaped around the principle of materiality. The European Union's ESRS framework is based on a double materiality approach, which encompasses both the impacts of company activities on society and the environment (from the inside out) and the effects of environmental and social developments on the company (from the outside in). In contrast, the standards of bodies like the ISSB and the U.S. Securities and Exchange Commission (SEC) adopt the principle of financial materiality, focusing only on factors that affect the company's financial performance. This divergence raises the risk of a new division in global trade, which could lead to the emergence of what might be called “sustainability blocs”.

Regardless of which scenario comes to pass, it is clear that regulations will become increasingly binding and comprehensive. In the near future, it is expected that not only climate-related reporting but also issues such as carbon taxes, supply chain due diligence laws, biodiversity reporting, and human rights reporting will become mandatory.

This regulatory transformation is not merely increasing reporting obligations; it is also fundamentally redefining business models, modes of value creation, and the ways in which companies respond to stakeholder expectations. Consequently, the shifting financial paradigms and regulatory dynamics are compelling companies to move beyond the limits of the linear economy and toward more inclusive and circular business models. As a result, the transformation triggered by regulations is not just a compliance burden but also a powerful catalyst for innovation. Accordingly, the next section investigates a critical question: how do these new rules foster innovation in business models? The analysis is guided by the dual perspectives of stakeholder capitalism and the circular economy.

5.2.4. The Transformation of Business Models: From Stakeholder Capitalism to the Circular Economy

The transformation taking place in the financial and regulatory arenas is compelling companies to abandon the confines of the linear economy, which is built upon the traditional “take-make-dispose” model. The successful businesses of the future will

be those that embrace the concept of stakeholder capitalism, centering their purpose on creating value not only for shareholders but for all stakeholders, including employees, customers, society, and the planet. The most practical application of this vision is the circular economy, an economic system designed to eliminate waste by shifting away from the traditional "take-make-dispose" model. Instead, it aims to keep products and materials in use for as long as possible and ultimately regenerate natural systems (Geissdoerfer et al., 2017).

Pioneering applications in this field demonstrate that circularity is not just a theoretical ideal but can also be a profitable business model. The Worn Wear program is one of the most well-known examples of this transformation. Under the program, customers can return used Patagonia products in exchange for store credit, reuse their products through repair services, or purchase refurbished second-hand items. This model not only reduces the amount of waste but also increases customer loyalty, creates a new revenue stream (the program reportedly generated 5 million USD in revenue in 2023), and makes the brand's promise of durability tangible (von Leyser, 2025) Similarly, the flooring manufacturer Interface has been recognized as a "Circularity Leader" by the World Economic Forum thanks to its "ReEntry" take-back program (Interface, 2024). Since 2016, the company has collected over 35,000 metric tons of used carpet tiles, both reducing its raw material costs and increasing its profit margins (Interface, 2025). In another example, the health technology giant Philips uses instruments like Green Innovation Bonds to finance its circular product development efforts, allocating €266 million to these projects in 2024 alone (Philips, 2025).

However, circular economy strategies are also the subject of various critiques. The phenomenon known in academic literature as the "rebound effect" or "Jevons Paradox" is one of the most significant risks in this area (Castro et al., 2022). According to this paradox, strategies that increase material efficiency or make recycled products more accessible can lower costs and thereby increase total consumption; thus, a significant portion of the environmental benefits achieved may be negated (Zink & Geyer, 2017). For

example, the increased ease of purchasing second-hand clothing might lead consumers to buy more new clothes under the assumption that they can easily resell them in the future (Stroumpoulis et al., 2024). This situation reveals that the success of circular business models is not solely dependent on operational efficiency; it also requires a holistic assessment of consumer behavior and the broader economic systems.

Therefore, the transition to a circular economy necessitates that companies radically rethink not only their operational processes but also their product design, marketing strategies, and customer relationships. This transformation will become the engine that makes the vision of stakeholder capitalism a reality. As sustainability becomes a key factor for companies to gain a competitive edge, the entire economic system will naturally shift to one that benefits everyone, not just shareholders The multi-dimensional nature of this transformation is summarized in Figure 5.1. This figure illustrates the four key forces that are shaping the future of sustainability reporting. It visualizes how technology, finance, regulation, and business models are all interconnected, working together to create the future of corporate transparency.

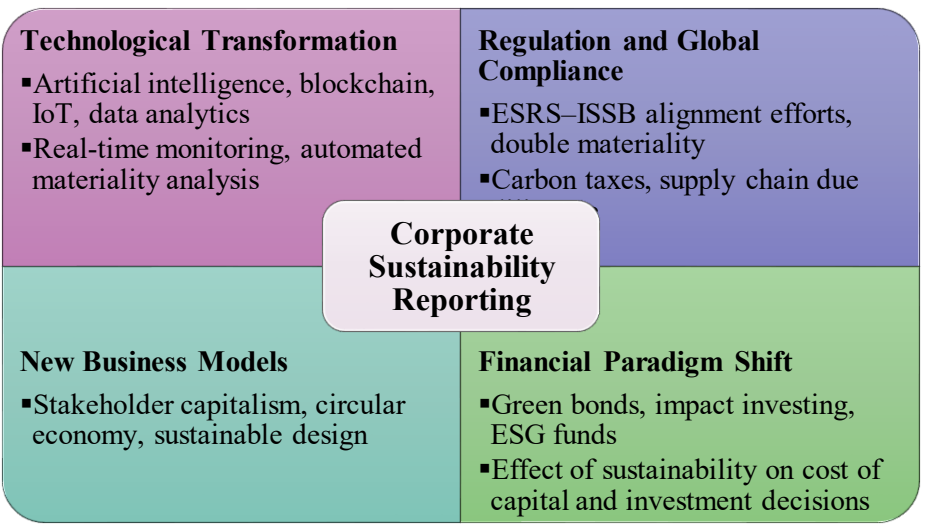


Figure 5-1 The Main Dynamics Transforming Corporate Sustainability Reporting

5.3.A Critical Assessment of the Transforming Nature of Corporate Sustainability Reporting

Over the last decade, corporate sustainability reporting has evolved from being merely a side element of the global governance architecture into a fundamental instrument that directly shapes the decision-making processes, stakeholder relations, and strategic positioning of companies. This study has analyzed this transformation from a holistic perspective, examining its theoretical origins, the structural divergences between different reporting standards, the various approaches to the concept of materiality, the challenges encountered in practice, and the corporate capacity shortcomings of audit mechanisms.

The fact that the examined standards focus on different user groups and target audiences leads to the emergence of distinct approaches, particularly around the concept of materiality. The absence of a unified reporting standard presents a dual challenge: it severely hinders the comparability of disclosures across firms and simultaneously creates opportunities for greenwashing, as companies can selectively adopt frameworks that portray their performance in the most favorable light.

The new European and Turkish standards (ESRS and TSRS) are built on the powerful concept of “double materiality” imposing companies to disclose a more comprehensive report. It’s a far more inclusive approach that moves beyond a purely financial perspective. However, in the transition to practice, the inadequacy of sectoral guides and deficiencies in the audit infrastructure make it difficult to fully implement this inclusivity. The global reporting landscape is currently a complex patchwork of different standards, which creates enormous technical and content-related challenges, especially for international companies. Türkiye's new reporting system (TSRS) is a clear example of this struggle. The effort to comply is being held back by three key issues: a lack of global comparability, limited corporate readiness, and underdeveloped digital infrastructure.

During this transformation, new technologies like AI and automated systems hold enormous promise. They offer powerful solutions for making corporate reporting more transparent and verifiable. However, with that promise comes significant threat.

These same tools create a new landscape of risks that we must navigate, including challenges to data privacy, the danger of algorithmic bias, and the need for strong ethical governance. In parallel, the rise of digital stakeholder engagement platforms underscores the importance of inclusivity in reporting, yet also raises new questions regarding representation, data privacy, and governance.

In light of these analyses, the prioritization of the following strategic steps is of critical importance for policymakers, regulatory bodies, and businesses:

- The development of indicator-based mapping and technical harmonization mechanisms between different standards.
- The formation of applicability guides based on sector and scale.
- The construction of more robust, independent verification systems that ensure content quality and accuracy.
- The expansion of sustainability education and training to build capacity across the entire stakeholder ecosystem.
- Considering digital transformation not just as a reporting burden, but as a competitive advantage in decision making processes.

This study shows that sustainability reporting is more than just an ideal on paper. By highlighting the real-world roadblocks, gaps in governance, and new tech dilemmas, it offers a critical reality check for policymakers, regulators and academics.

The road ahead requires deeper investigation into several critical areas. Future studies should prioritize application of double materiality across different sectors, the real-world effectiveness of digital audit technologies, and the crucial ethical boundaries for AI-driven reporting. Such research is expected to both enrich the body of academic knowledge and to produce concrete strategic recommendations for policymakers.

In addition to these areas, future research should explore the application of emerging technologies in specific contexts. For instance, the use of digital twins in sector-specific sustainability

planning, the adoption of XBRL taxonomies in emerging economies, and the ethical boundaries of stakeholder engagement platforms and AI-driven reporting tools present fertile ground for scholarly inquiry. Such research would not only expand the academic debate but also generate actionable insights for policymakers and practitioners seeking to design inclusive, technologically robust, and ethically sound sustainability reporting systems.

6. CONCLUSION: A HOLISTIC VIEW OF CORPORATE SUSTAINABILITY REPORTING

The concept of corporate sustainability has undergone a distinct evolution, moving from its origins in the paternalistic philanthropy of the Industrial Revolution to a strategic imperative that seeks solutions to the complex and intertwined global crises of our time. It has become unequivocally clear that it is no longer possible for businesses to survive as closed, profit-only systems; they must now position themselves as inseparable components of an ecosystem, with all its ecological, social, and governance dimensions. This transformation confirms a central truth: traditional economic models are no longer fit for purposes. Sustainability has cemented its role as an irreversible paradigm shift, moving from a marginal concern to the very core of business success defining a company's legitimacy, competitiveness, and resilience.

At its heart, this paradigm shift is a move from Milton Friedman's narrow focus on shareholders to R. Edward Freeman's broader vision of a company that serves all its stakeholders, from employees to the community. Business success is now measured not only by financial returns but by the capacity to create value for all stakeholders affected by its operations. This transformation, however, has also brought with it serious tensions and challenges. On one hand stands the European Union's multi-stakeholder vision (ESRS), based on the principle of double materiality, which centers on environmental and social impacts. On the other lies the investor-focused, financial-materiality-based approach of the global capital markets (ISSB). The clash of these two paradigms has created duplicate reporting burdens and strategic confusion, especially for multinational corporations, forming one of the most critical geopolitical tension points of our day.

Despite ongoing standardization efforts, the credibility of reporting remains one of the most fundamental problem areas. At this juncture, the concept of materiality has transformed into a double-edged tool that companies can flex to strategically present their performance in a more favorable light. This flexibility creates a fertile ground for deceptive practices such as green, social, and blue washing, the biggest ethical problems in the reporting field, and in

doing so profoundly erodes stakeholder trust. The independent assurance mechanisms developed to close this credibility gap, meanwhile, still harbor significant deficiencies in terms of methodological maturity and competence. Nevertheless, developments in the fields of technology, finance, business model transformations, and governance are charting a promising strategic horizon for the future of sustainability. In the face of these challenges, the businesses that will succeed in the future must possess the following key characteristics:

- **Strategic Integration:** The integration of sustainability into all decision-making processes, starting at the board level; viewing it not as a compliance obligation or a reporting burden, but as the key to innovation, efficiency, and long-term resilient.
- **Dynamic Stakeholder Management:** Moving beyond static stakeholder mapping to develop a continuous, meaningful, and two-way dialogue with stakeholders; institutionalizing the ability to manage conflicting interests and create shared value.
- **An Ethical Compass and Radical Transparency:** This new strategy is built on three interconnected pillars. It requires companies to first embrace the radical transparency of the digital age as an opportunity, not a threat. This is coupled with a firm commitment to actively combat greenwashing and is ultimately grounded in building stakeholder trust by honestly reporting on both successes and shortcomings.
- **Circular and Regenerative Thinking:** Moving beyond the linear "take-make-dispose" model to develop circular business models that design out waste and pollution, keep materials in circulation at their highest value, and regenerate natural systems.

To ensure that corporate sustainability reporting evolves into a more effective, transparent, and credible structure, the following recommendations should be prioritized:

1. **Inter-Standard Harmonization (Political Level):** Developing indicator-based mapping and technical alignment mechanisms between standards such as ISSB, ESRS, and TSRS to reduce the dual reporting burden and increase global comparability.
2. **Sectoral Guidance (Political/Corporate Interface Level):** Developing a practical playbook that works in all sectors of company size, with a special focus on supporting SMEs.
3. **Independent Audit and Assurance (Corporate Level):** Minimizing the risk of greenwashing with a clear focus on the quality and integrity of the data being reported.
4. **Capacity Building (Corporate/Academic Level):** Having government, businesses, and universities team up to create more industry-specific training programs for sustainability reporting.
5. **Ethical and Governance Framework (Political/Technological Interface Level):** Creating ethical and governance processes for the use of technological tools that manage the serious risks of data privacy, algorithmic bias, and transparency.
6. **Digital Integration (Technological Level):** Dual application of new technologies, leveraging AI and Blockchain not only to enhance data transparency but also to embed analytical insights into strategic decision-making.

Corporate sustainability is the new management philosophy, redefining value to include social and environmental impacts alongside profit. This transformation is guiding businesses toward a strategic vision centered not on a framework of mere legal compliance, but on stakeholder trust, innovation, and long-term resilience. The businesses of the future will be those that see

sustainability not as a cost item or a marketing element, but as the fundamental source of competitive advantage, social legitimacy, and ecosystem resilience.

This study has aimed to provide a framework for businesses, policymakers, and academics who wish to understand and navigate this complex transformation process by systematically analyzing the historical, theoretical, and practical dimensions of corporate sustainability. However, it must not be forgotten that the success of this transformation is not solely dependent on the individual efforts of companies; it must be seen as a collective process that requires the entire ecosystem to assume shared responsibility. In this perspective, the roles and responsibilities of key players are taking on new meaning.

- **Corporate Managers:** Leading with conviction by embedding sustainability into the culture and choosing long-term resilience over short-term financial pressures.
- **Investors:** To look beyond superficial ESG scores and to direct capital to companies with sustainability performance that is backed by transparent, auditable, and concrete data.
- **Policymakers:** The goal is to move from a standards war to global accord by creating a single, regulatory framework. This system creates a fair burden for companies, increases comparability, and features stiff consequences to prevent greenwashing.
- **Academia:** To expose the gaps between theory and practice, to critically monitor this dynamic field, and to cultivate the ethical, visionary leaders of the future.

Future research must conduct in-depth investigations, particularly into the application of the double materiality principle in different sectors, the ethical boundaries of digital audit and blockchain-based assurance mechanisms, and the macroeconomic impacts of circular economy models. Furthermore, empirical studies on the institutionalization of collaboration among policymakers, the business world, and academia will fill a critical gap in the evolution

of reporting standards. In this way, not only the theoretical framework but also the practical applications will be transformed, shaping the future of corporate sustainability reporting.

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