The Imperative of Mandatory ESG Disclosure for Enterprises: Theoretical Debates and Institutional Frameworks

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Abstract: Against the backdrop of China's "dual carbon" objectives and the global imperatives of sustainability, the currently prevalent voluntary ESG disclosure mechanism has been found to be insufficient. It has given rise to issues such as data distortion, impairments of stakeholders' rights, and extensive instances of "greenwashing". This study systematically expounds on the necessity of a mandatory ESG disclosure system. Going beyond mere criticism of voluntarism, it endeavors to construct a comprehensive theoretical and institutional framework. By adopting a comprehensive, multi-methodological approach that encompasses a critical synthesis of academic literature, policy documents, and empirical research, this study redefines the theoretical basis. It does so by introducing "environmental information rights" as a fundamental human right, thus surpassing traditional rationales for government intervention. This research further delves into core controversies, encompassing legal legitimacy, the compliance costs of small and medium-sized enterprises (SMEs), and the ambiguous definition of "materiality." The investigation findings lead to the proposition of a novel Differentiated Mandatory Disclosure System. This is a tiered framework meticulously designed to align with industry risks and enterprise scale. For Systemically Important ESG Entities (SISEs), it enforces immediate and guaranteed disclosure, while for other firms, it adopts phased and voluntary-plus strategies. This architectural design is underpinned by dynamic monitoring mechanisms, synergistic incentive-penalty frameworks, and integration with digital tools. The study reaches the conclusion that this system, which is legally sound, economically efficient, and technically viable, is essential for facilitating green transformation, safeguarding the public interest, and rectifying market failures. Specifically, the research offers concrete recommendations for legislative reforms in China, including the revision of the Environmental Protection Law. By doing so, it presents a comprehensive blueprint for a disclosure regime that harmonizes global standards with local requirements, thereby strengthening the foundation for high-quality and sustainable economic development.

Keywords: Mandatory ESG Disclosure; Environmental Information Rights; Differentiated Disclosure Framework; Institutional Design

1. Introduction

Looking ahead, the research and practice of ESG information disclosure have reached a historic juncture. There is a shift from voluntary to mandatory disclosure, and from mere compliance to value generation. Based on the findings and limitations of this study, future research could focus on the following aspects:

First and foremost, conduct cross-national and cross-jurisdictional comparative institutional studies. Mandatory ESG disclosure regimes in numerous jurisdictions, including the EU, the US, and China, have been successively implemented or strengthened. This provides a natural environment for comparative research. In future investigations, it is crucial to systematically compare the design, implementation results, corporate responses, and socio-economic implications of these systems. This approach will help verify the robustness and adaptability of the differentiated disclosure model within various institutional settings and offer evidence for the convergence and healthy competition of global standards.

Secondly, deepen the exploration of the synergistic effects between ESG disclosure and other policy instruments. In future research, it is of great significance to embed ESG disclosure within a more comprehensive policy portfolio. Through quantitative analysis, the interactions between ESG disclosure and components such as carbon markets, environmental taxes, green subsidies, and circular economy policies ought to be investigated. For example, exploring the variation in the driving effect of mandatory carbon disclosure on corporate emission reduction behaviors under different carbon price signals can provide vital decision-making support for the construction of an efficient and synergistic green policy framework.

Thirdly, actively engage in and conduct in-depth research on the governance of ESG data digital transformation. With the extensive and profound application of digital technologies, future research efforts need to confront and address the new issues that have emerged. Specifically, how can blockchain technology be effectively utilized to ensure the immutability and traceability of carbon emission data? How should ethical guidelines for the application of artificial intelligence in ESG data analysis be systematically formulated? And how can unified data interfaces and standards be established to promote seamless interoperability? The solutions to these questions will act as the theoretical vanguard in building the next-generation intelligent and reliable ESG information disclosure infrastructure.

Fourthly, it is of utmost importance to intensify research efforts and delve into implementation strategies tailored to the Chinese context. In the Chinese scenario, future research should be meticulously aligned with the "dual carbon" strategic goals. There is an imperative need to further elaborate on differentiated disclosure criteria that are congruent with the national conditions. Specifically, it is of critical significance to formulate industry-specific Key Performance Indicators (KPIs) for a wide range of sectors, including energy, manufacturing, finance, and technology. Simultaneously, research should be carried out on the cultivation of a domestic ESG service ecosystem, encompassing aspects such as third-party verification, data services, and talent development. Furthermore, it is necessary to explore feasible pathways for a more profound integration of ESG performance into the corporate credit system and financial resource allocation.

In conclusion, the establishment of a mandatory ESG information disclosure system is no longer a question of "whether it should be implemented," but rather a challenge of "how to optimize it." This study provides a systematic framework for academic discussions and policy practices in this field. Future research will continuously enrich and refine this framework through empirical verification, technological integration, and policy coordination. Eventually, this will prompt enterprises to become a central driving force in achieving the global sustainable development goals.

2. Literature Review

By conducting a comprehensive review of the relevant literature, we postulate that the most optimal trajectory ahead lies in the establishment of a Differentiated Mandatory Disclosure System. This system is far from being a simple compromise; rather, it is a refined, principle-driven framework meticulously crafted to optimize societal advantages while minimizing compliance expenditures. It is firmly grounded in solid jurisprudential, economic, and technical underpinnings.

2.1 Jurisprudential Foundation: The State's Obligation to Safeguard the Public Interest and Guarantee Intergenerational Equity

The legal philosophy that serves as the foundation for this system is the state's intrinsic responsibility to rectify market failures and safeguard public goods. The environment, social cohesion, and transparent corporate governance are fundamental public goods. The substantial information asymmetry extensively documented in the literature, wherein companies have complete knowledge of their negative externalities while investors and the public are kept uninformed, represents a profound market failure. This asymmetry results in a misallocation of capital towards unrecognized "brown" firms, as intimated by Xiao Qiang's finding that enhanced ESG performance alleviates financial mismatch.

The jurisprudential rationale transcends classical economics and encompasses the concept of intergenerational equity. The environmental deterioration resulting from unreported and unaddressed pollution, as exemplified by the cases of A Petroleum and B Coal, inflicts costs on future generations. The state, acting as a trustee for future citizens, has a legitimate interest and obligation to enforce transparency to protect their rights. This constitutes a legal and ethical basis for coercive measures. The findings of Lai Yan, indicating that "penalty pressure" is a core and irreplaceable condition in all configurations leading to high peer effects in ESG disclosure, strongly validate the necessity of a "robust" regulatory approach. The law should not merely require disclosure but also stipulate meaningful sanctions for non-compliance and deception, thereby converting ESG data from a marketing asset into a legal obligation.

2.2 Economic Efficiency: A Cost-Benefit Analysis for the Strategic Allocation of Resources

A differentiated system essentially constitutes an endeavor in economic efficiency, with the aim of optimizing the net social benefit derived from ESG disclosure.

The primary responsibility for disclosure should rest with "Systemically Important ESG Entities" (SISEs). This classification encompasses: First, listed companies operating in high-impact sectors such as energy, materials, utilities, and finance. Given that their operations generate far-reaching impacts across the economy, these companies play a crucial role. Second, Large State-Owned Enterprises (SOEs). As Li Na has pointed out, SOEs are regarded as "the pillars of the national economy" and are already held to higher expectations by SASAC.[1] Third, large private enterprises that leave a substantial environmental footprint. For these entities, the social advantages of transparency, including informed investment decisions, decreased environmental remediation costs, and strengthened financial stability, significantly outweigh the compliance costs. Moreover, due to economies of scale, they are in the best position to shoulder these costs.

Besides, mitigating undue burdens on small and medium-sized enterprises (SMEs) and promoting innovation is also important. A uniform mandate would inflict a disproportionately heavy cost on SMEs. This could potentially debilitate these enterprises and dampen economic vitality. Instead, an approach tailored to different circumstances, such as a more extended grace period, streamlined disclosure formats, or full exemption for micro-enterprises, is crucial for safeguarding this essential economic segment. This approach is consistent with the findings in Li Na's research, which indicates that smaller firms inherently trail in their disclosure capabilities. By initially providing protection, the regulatory system enables these firms to develop and gradually transition into the mandatory compliance framework. Meanwhile, the market can still offer incentives to early voluntary adopters, thereby fostering a more balanced and dynamic business environment.

In addition, Unleashing Economic Value via Transparency is practical. Abundant evidence in the literature indicates that high-quality ESG disclosure is not merely a cost but rather an investment. Lu Lijuan's research shows that it can boost firm value. Xiao Qiang's work demonstrates that it mitigates financial mismatches and reduces the cost of capital. Guo Ting's findings reveal its crucial role in propelling green transformation along the supply chain. A differentiated system accurately channels these economic benefits to those firms that make substantial improvements in their ESG performance, thereby establishing a potent virtuous cycle. This makes "doing good" demonstrably equivalent to "doing well" in a verifiable way. [2]

2.3 Technical Feasibility: The Maturity of Data Infrastructure and Assurance Mechanisms

Owing to the progress in data governance and verification, the practical implementation of a differentiated system has become increasingly feasible.

First, data Acquisition and Quantification: The methodology adopted by Zhang Yuan, which involves using text analysis of annual reports to quantify "green transformation" and "executive environmental attention", demonstrates that non-financial data can be systematically captured and analyzed. The widespread availability of big data and AI tools enables the automation of the collection and initial processing of such information, thereby alleviating the manual workload.

Second, tiered Standard-Setting: The coexistence of multiple international frameworks, such as the Global Reporting Initiative (GRI), the Sustainability Accounting Standards Board (SASB), and the Task Force on Climate-related Financial Disclosures (TCFD), along with China's newly introduced Sustainable Disclosure Standards, offers a substantial resource base for the construction of a tiered system. As Li Na posits, the crux lies in carrying out "industry-specific materiality assessments." For instance, the crucial key performance indicators

(KPIs) for a coal company, such as methane capture rates and water consumption per ton of coal, would diverge from those of a bank, like the green finance ratio and financial inclusion metrics. A differentiated system can enforce this sector-specific level of detail for State-owned and State-invested Enterprises (SISEs), while enabling other enterprises to adopt a more general standard.

Third, Party Assurance and the Evolving Talent Pool: The persistent demand for third-party audit in the works of Yu Zhongfu, Li Na, and Jin Lan indicates a widely recognized solution to the credibility issue. [3] As elaborated by Zheng Cuiying, the concurrent emergence of a specialized ESG talent market is generating the essential human capital required to staff both the assurance providers and the corporate departments accountable for compliance. Moreover, the mandatory director training in Gao Ge further guarantees that those with oversight duties possess a proficient understanding of these matters. [4]

In summary, the cumulative evidence gleaned from the cited literature presents a distinct scenario: the era of voluntary ESG disclosure has drawn to a close. However, the path forward does not entail a simplistic, one-size-fits-all mandate. Instead, it lies in a sophisticated, nuanced, and legally sound system. By aligning disclosure obligations with risk profiles and capabilities, strengthening disclosure mechanisms through a combination of market-driven incentives and stringent penalties, and integrating the entire framework within a reformed legal architecture, China can establish an ESG disclosure regime that effectively propels substantial green transformation, safeguards the public interest, and fortifies the foundation for its long-term, high-quality economic development. This is not only an imperative but also the logical progression illuminated by a comprehensive and critical synthesis of the current academic and practical landscapes.

3. Results and Discussions

3.1 Basic Premises and Conditions of the Research

The core data underpinning this study are solely sourced from publicly accessible academic monographs, peer-reviewed journal articles, and authoritative databases. The processes of data screening and organization are meticulously conducted in strict accordance with academic norms. Precedence is given to research that has undergone rigorous peer review and employs robust methodologies, thus guaranteeing the authenticity and reliability of the data at the very origin.

Moreover, this paper comprehensively integrates theoretical viewpoints and research insights from scholars across a wide spectrum of disciplines. This integration encompasses both classical theories and state-of-the-art explorations in multiple domains. Through a systematic synthesis, comparison, and integration of multifaceted academic ideas, the study not only constructs a robust theoretical foundation for its analytical framework but also alleviates the cognitive constraints inherent in single perspectives. This methodology ultimately ensures the logical precision of the argumentation and the scientific objectivity of the research findings.

3.2 Sorting out and Integrating Diverse Ideas: Why does an Enterprise Need to Establish an ESG Information Disclosure System, and what Kind of System should it be?

3.2.1 Why is it of utmost importance to establish an ESG information disclosure system for enterprises?

From the viewpoints of "compliance and adaptation", ESG information disclosure serves as the "fundamental basis" for enterprises to address both internal and external regulatory pressures. With the increasing stringency of global ESG regulations, multinational enterprises are obliged to comply with overseas standards, such as EU ESG regulations and carbon footprint requirements. In China, the Stock Exchange mandates directors to undergo ESG training, while A-share markets are progressively intensifying disclosure obligations. ESG disclosure has evolved from being a "bonus factor" to a "prerequisite". This compliance pressure not only drives the professionalization of ESG positions-for instance, the emergence of specialized roles in supply chain management and capital market engagement-but also forces enterprises to incorporate ESG into their daily operations. This is to prevent the loss of market access qualifications or the incurrence of penalties resulting from compliance shortcomings. [5]

From the vantage point of "capital connectivity", ESG information disclosure functions as a

"bridge" enabling enterprises to mitigate financing costs and attract green investments. [6] The attention of investors towards the ESG performance of enterprises is on the rise. High-quality ESG disclosures can effectively alleviate information asymmetry between enterprises and investors, facilitating investors in clearly discerning the sustainable development potential of enterprises. For example, the transparency of environmental accounting information (such as the disclosure of environmental costs, liabilities, and revenues) can directly ease the financing challenges faced by enterprises and even assist them in obtaining green credit discounts. Particularly for industries like traditional energy and manufacturing, which necessitate substantial green capital support, ESG disclosure has emerged as a "gateway" to access the capital market.
In the realm of "green transformation", ESG information disclosure serves as the crucial "lever" for enterprises to pursue the "dual carbon" objectives and effectuate systematic transformation. Historically, enterprises' ESG endeavors frequently succumbed to the pitfall of "piecemeal approaches" – for instance, hastily collating carbon emission data during the bidding process. Conversely, standardized ESG disclosure has the potential to impel enterprises to integrate green transformation into their strategic blueprints, thereby compelling technological innovation (such as the development of emission reduction methodologies and the design of green products) and management optimization (such as the decarbonization of the supply chain). Significantly, ESG disclosure can establish a virtuous cycle of "executive environmental focus – green transformation – high-quality disclosure": executives' heightened attention to environmental concerns propels the implementation of transformation, and the outcomes of such transformation are manifested through disclosure, thereby enhancing the enterprise's green reputation.
From the vantage point of "risk management", ESG information disclosure serves as a "powerful instrument" for rectifying the chaos of "greenwashing" and upholding market fairness. At present, certain enterprises exhibit the issue of "strategic disclosure". [7] For instance, they falsely promote environmental investments, conceal pollutant emissions or environmental fines. Such actions not only mislead investors but also erode market trust. Standardized ESG disclosure, by mandating the quantitative disclosure of negative information (such as pollutant emissions and fine amounts) and introducing third-party verification, can effectively rein in "greenwashing", mitigate financial risks stemming from information asymmetry (such as valuation fluctuations), and attain a win-win scenario of "ecological civilization construction and high-quality economic development".
From the vantage point of "performance enhancement", ESG information disclosure serves as the "locomotive" enabling enterprises to address the requirements of stakeholders and elevate their comprehensive competitiveness. In accordance with stakeholder theory, ESG disclosure is capable of fulfilling the diverse anticipations of the government (regulatory requirements), consumers (green consumption preferences), and investors (value investment requisites). [8] Internally, it can cut costs via supply chain decarbonization and boost product premiums through green innovation. Externally, it can enhance brand reputation and attract high-quality resources. Ultimately, it propels the improvement of enterprise financial performance along the trajectory of "cost reduction + efficiency augmentation + credibility strengthening", thereby becoming a crucial safeguard for the high-quality development of enterprises.

3.3 What Kind of ESG Information Disclosure System should Enterprises Establish?

3.3.1 Establishing a standard foundation via "categorization refinement and international alignment"
Standards function as the "cornerstone" of ESG information disclosure and necessitate the avoidance of a "one-size-fits-all" approach, striking a balance between universality and specificity. Firstly, the disclosure content should be classified according to business scenarios and industry characteristics. For supply chain enterprises, emphasis should be placed on disclosing the audit processes of supplier social responsibility and traceability systems. Meanwhile, board offices should concentrate on regulatory information relevant to financial institutions. The catering industry ought to disclose food waste management and the progress of zero-carbon store construction. The internet industry should publicize cybersecurity

measures and responses to cultural controversies. Traditional energy enterprises are required to present detailed data on environmental investments and pollutant emissions. Secondly, it is of utmost importance to "harmonize international standards with local requirements". By drawing on mainstream international frameworks such as the GRI (Global Reporting Initiative) and the TCFD (Task Force on Climate-related Financial Disclosures), and incorporating domestic objectives like the "dual-carbon" target and the demands of overseas expansion, localized guidelines (e.g., adaptation strategies for EU ESG regulations) ought to be formulated. This will assist enterprises in reducing cross-border compliance costs. Moreover, "the disclosure requirements for specific sectors need to be clearly defined". For instance, mandating the disclosure of "ESG-business" synergy outcomes (e.g., the impact of supply chain decarbonization on costs, the emission reductions associated with green technology investments) and monetized environmental accounting information (e.g., environmental cost measurement methods, the scale of environmental liabilities) is necessary to prevent "ambiguous statements".

3.3.2 Enhancement of regulatory safeguards via "third-party assurance plus violation penalties"

Regulation serves as a "barrier" to safeguard the quality of ESG information disclosure, with a particular emphasis on combating greenwashing and ensuring data authenticity. Firstly, the introduction of a third-party independent assurance mechanism is crucial. It is necessary to require that corporate ESG reports be verified by accounting firms or professional institutions. Clear assurance procedures and liability boundaries should be defined to prevent assurance-related rent-seeking behavior. Meanwhile, the promotion of digital tools (such as dual-carbon digital platforms) should be carried out to achieve end-to-end traceability in the processes of ESG data collection, storage, and analysis, thereby ensuring data authenticity from a technical perspective. Secondly, the establishment of a greenwashing identification and penalty system is essential. Regulatory authorities ought to conduct regular audits of ESG report data and formulate criteria for identifying greenwashing behaviors (for example, false disclosure of emission reductions and concealment of environmental penalties). Establish an environmental credit rating system and levy differentiated penalties on non-compliant enterprises. These penalties should include restricting financing channels, increasing the frequency of regulation, and adding them to the list of discredited entities, thereby creating a deterrent mechanism that can "deter and prevent greenwashing." Thirdly, enforce differentiated regulation: strengthen the supervision of key entities, such as state-owned enterprises, high-energy-consuming enterprises, and enterprises expanding overseas. Meanwhile, offer compliance guidance to small and medium-sized enterprises to avoid an overly simplistic "one-size-fits-all" regulatory approach.

3.3.3 Stimulating disclosure motivation via "policy incentives + resource support"

Incentive mechanisms function as the "engine" for boosting corporate enthusiasm in ESG disclosure, striking a balance between "rewards" and "support". Concerning "policy subsidies", enterprises demonstrating high-quality ESG disclosures are likely to be granted preferential green credit, environmental tax cuts, and tiered subsidies based on emission reduction volumes. Entities with relatively weak disclosure incentives, such as enterprises in western regions and non-state-owned enterprises, should be provided with specialized subsidies to alleviate their compliance costs. Regarding "resource allocation", green products should be given precedence in government procurement lists. The environmental approval procedures should be optimized, and a supportive business environment should be created to facilitate corporate green transformation. Green innovation funds should be established to offer financial backing for the research and development of emission reduction technologies and the upgrading of green supply chains, thereby fundamentally reducing the impetus for "strategic disclosure" (for example, hiding negative information due to high environmental costs). Moreover, "strengthen the linkage of external supervision": encourage institutional investors to conduct on-site investigations to verify corporate ESG practices, support analysts in releasing specialized ESG reports, and guide the media to report objectively on corporate ESG achievements and issues, thus forming a dual supervisory force of "regulation + market".

3.3.4 Strengthening the implementation foundations via "digital tools + talent development"

Tools and expertise serve as the "backbone" for the implementation of ESG information disclosure, effectively addressing pain points such as "inefficiency and limited professional knowledge." In the realm of digital infrastructure building, the promotion of ESG intelligent management platforms is crucial. These platforms facilitate real-time monitoring of carbon emission data, early warnings of ESG risks within supply chains, and automated report generation, thereby enhancing the efficiency and accuracy of disclosure. Concurrently, text analysis technologies are employed to construct green keyword libraries (e.g., "carbon reduction," "green innovation"), enabling the quantification of ESG disclosure quality and providing technical underpinnings for unified evaluation criteria.

Regarding talent cultivation, a dual-track approach at both the corporate and societal levels is essential. Enterprises should nurture in-house professionals through ESG project initiatives (e.g., supply chain decarbonization projects). Meanwhile, social institutions should offer certification training programs for ESG managers and carbon accountants, thereby meeting the professional competency requirements for disclosure (e.g., proficiency in rating standards, ESG report compilation, and international compliance responses).

3.3.5 Enhancement of intrinsic drivers via "corporate governance + responsibility binding"

Intrinsic drivers serve as the "core" for the sustainable disclosure of ESG information, necessitating the integration of ESG into corporate governance systems.

Firstly, "reinforce the binding of executive responsibilities": Integrate environmental metrics (such as the completion rates of carbon reduction targets and the proportion of green technology investments) into executive performance evaluations. This compels executives to increase their focus on environmental matters and elevate ESG from a "departmental task" to a "strategic agenda".

Secondly, "optimize the corporate governance structure": Enhance the independence of the board, establish specialized environmental management committees, and clarify internal ESG control processes (such as data review mechanisms and ESG risk assessment procedures). This forms a closed-loop ESG management system spanning from decision-making to execution.

Furthermore, promote "substantive disclosure" by obliging enterprises to disclose not only "what has been accomplished" but also "how effectively it has been achieved". For instance, disclose the specific outcomes of environmental investments and the progress towards emission reduction targets. This ensures that ESG disclosure truly reflects corporate practices rather than mere "formal compliance".

3.4 Pathways for the Institutional Construction of a Differentiated Mandatory Disclosure Regime

3.4.1 Tiered design of disclosure standards: An approach marked by phases, categories, and dynamism

The system ought to be configured as a set of concentric circles, wherein the obligations escalate in accordance with a firm's systemic significance.

Tier 1: Core SISEs (Immediate and Comprehensive Mandatory Disclosure). This tier encompasses all publicly listed companies within heavy-polluting sectors (as defined by regulatory authorities), all financial institutions, and all central state-owned enterprises. Their obligations ought to be the most rigorous. Mandatory and assured reporting's entities are required to issue an annual sustainability report that is in line with the core content of China's Sustainable Disclosure Standards. For key quantitative metrics (such as Scope 1 & 2 GHG emissions, energy consumption, and major pollutant discharges), mandatory third-party assurance is obligatory. Industry-Specific key performance indicators (KPIs) is necessary to disclose a set of sector-specific, quantitative performance indicators that have been developed by regulators in consultation with industry bodies. Governance disclosures are essential to elaborate on the board-level supervision of ESG risks, as advocated by the model (Gao Ge). Additionally, executive compensation should be linked to ESG performance targets.

Tier 2: encompasses General Listed Companies and Large Non-Listed Firms, for which a phased-in mandatory disclosure regime is implemented. This group will be granted a transition period of 2-3 years. Initially, they will be subject to a "Comply-or-Explain" requirement based on a simplified set of standards. Over time, they will gradually progress towards full compliance with assured reporting. Such a phased approach facilitates capacity building.

Tier 3: Small and Medium-sized Enterprises

(Voluntary-Pius Regime). For SMEs, disclosure would continue to be voluntary; however, it would be strongly incentivized. Regulatory authorities could provide a simplified, template-based reporting tool to alleviate the burden on SMEs. The government could initiate "pilot programs" and publicly recognize high-performing SMEs to encourage the voluntary adoption of relevant practices.

3.4.2 Synergistic incentive and constraint mechanisms: The roles of rewards, penalties, and reputational signals

For a system to achieve success, it is imperative that compliance be made rewarding while non-compliance incurs significant costs. Here we can adopt the "carrot and stick" strategy.

The incentive mechanisms (i.e., The Carrots) include three parts. First, the green finance pipeline: establish a formal connection between high-quality and reliable ESG reports and access to preferential "green credit" from banks, lower-interest bonds, and government-guided investment funds. Xiaoqiang's research on alleviating financial mismatch offers an empirical foundation for this initiative. Second, the fiscal and procurement incentives: assign scoring benefits in government procurement and grant access to targeted subsidies (such as those for energy-saving technologies) to enterprises with robust and verified ESG performance. This approach directly links public support to demonstrable sustainability, thereby establishing a clear connection between corporate ESG achievements and public resource allocation. Third, the reputational awards: The government should proactively curate a "white list" of outstanding ESG performers. By offering them official acknowledgment and promotion, it can effectively enhance their brand value.

The constraint mechanisms (i.e., The Sticks) also include three parts: First, the substantive penalties: fines imposed for "greenwashing" and non-disclosure should be substantial. They ought to be computed as a percentage of annual revenue or the economic benefit derived from the violation. This approach is essential to eliminate any profit incentive for engaging in fraudulent behavior. The cases in Yu Zhongfu illustrate that the penalties in the past were evidently inadequate in serving as a deterrent. Second, executive accountability: establish a "one-vote veto" mechanism for state-owned enterprise (SOE) leaders who commit serious violations in ESG disclosure. Such violations should have a direct impact on their performance appraisals and promotion opportunities. Third, the market access restrictions: the establishment of a public corporate ESG credit rating system is proposed. Enterprises with consistently subpar ratings may encounter limitations in their participation in public projects, more rigorous environmental inspections, and heightened regulatory oversight.

3.5 Facilitating Legislative and Judicial Reforms: Integrating ESG into the Legal Framework

The system's ultimate durability and authority hinge upon its deep-rooted establishment within the framework of law.

I suggest that specialized legislation: the cornerstone lies in the drafting and promulgation of a dedicated "Enterprise Sustainable Development Information Disclosure Law". This law should clearly stipulate the following aspects: the national leading regulatory body (for example, a cross-ministerial committee led by the China Securities Regulatory Commission and the Ministry of Ecology and Environment); the legal concept and scope of "Sustainable Information"; the tiered categorization of obligated entities; the legal liability for false disclosure (including the liability of third-party assurers); and the specific powers of regulators.

And the revision of existing laws can cover diverse aspects. As for Company Law: amendments should be made to explicitly stipulate that the board of directors bears a fiduciary duty to take into account the long-term interests of the company. This encompasses effectively managing ESG risks that pose threats to its sustainable existence. Such an amendment would legally endow directors with the power and impose on them the obligation to seriously oversee ESG-related matters. As for Securities Law's amendment, incorporate ESG information comprehensively into the mandatory periodic disclosure requirements for listed companies. Clearly define false statements or material omissions in ESG reports as a form of securities fraud, which shall be subject to corresponding legal sanctions and civil liabilities. And as for the Environmental Protection Law, it could be amended to stipulate that the environmental information disclosed in accordance with the sustainability law should be incorporated into the environmental credit evaluation system of enterprises. Additionally, in judicial practice and civil litigation, it is advisable to encourage the

Supreme People's Court to promulgate guiding cases or judicial interpretations that clearly define the legal channels for civil litigation in instances of "greenwashing". Investors who incur losses due to reliance on fraudulent ESG reports should be entitled to claim compensation from the company and its directors. Such a private right of action would establish a potent, decentralized enforcement mechanism that serves as a complement to public regulation.

3.6 Green Transformation and High-Quality Development: Operational Definitions and Quantifiable Metrics

Mandatory corporate Environmental, Social, and Governance (ESG) disclosure constitutes an institutional cornerstone for integrating green transformation with high-quality development. Its core significance resides in tackling environmental externalities through standardized information disclosure, optimizing the efficiency of resource allocation, and establishing a unified reference framework for policy implementation and corporate practices. Operationally, green transformation is defined as the systematic incorporation of environmental responsibilities into the entire production and operational processes. Driven by green economic policies (such as green subsidies, tax incentives, and carbon emissions trading)[9] and green credit discount policies[10], this is achieved through optimizing the energy structure, upgrading pollution control measures, and managing non-CO_2greenhouse gasses (including CH_4, N_2O, and HFCs).[11] This transformation reflects a transition from "passive compliance" to "proactive emission reduction," ultimately internalizing the negative environmental externalities. High-quality development, with ESG integration at its core, represents a sustainable growth paradigm. It emphasizes enhancing corporate governance (for example, the ESG capabilities at the board level)[12], reducing financing costs[13], and increasing the value of intellectual property through ESG disclosure[14]. By ensuring stable economic performance while balancing social responsibilities (such as employee welfare and community engagement), it unifies the creation of economic, environmental, and social value.

At the quantifiable standards level, a comprehensive literature review reveals that green transformation necessitates mandatory disclosure to precisely define the following metrics: the coefficient of the core explanatory variable, which reflects a significant enhancement in ESG information disclosure levels (lnDod) among enterprises covered by green economy policies when compared to the pre-implementation periods; the average increment in the quality scores of environmental information disclosure, which is propelled by green credit subsidy policies; the reduction in anthropogenic CH_4 emissions relative to the baseline, along with the completeness rate of relevant emission data disclosure under non-CO_2 gas regulations; and the compliance rates of major pollutants (such as SO_2, COD) emissions and statutory environmental information disclosure within high-pollution industries.[15] Concurrently, high-quality development requires mandatory disclosure to verify multidimensional outcomes: the financing cost (calculated as interest expense divided by total liabilities) of enterprises disclosing data asset information; whether board members complete at least two hours of specialized ESG training per fiscal year; and the optimization of energy utilization efficiency achieved through carbon information disclosure in digitally transformed enterprises.[16]

The implementation of these quantitative standards hinges upon institutional safeguards for mandatory disclosure. Firstly, mandatory disclosure serves to prevent enterprises from engaging in selective reporting. As evidenced by Gao Yuqiang's research, it obliges companies to accurately disclose environmental data through the regulatory compliance effects of the government, thus effectively addressing the issue of "greenwashing". Secondly, the heterogeneity analysis carried out by Zhang Qinfa reveals that under the requirements of mandatory disclosure, the eastern regions, manufacturing industries, and non-state-owned enterprises demonstrate more pronounced outcomes in green transformation and high-quality development. Simultaneously, Chang Xin's propositions, including the establishment of a unified environmental information disclosure platform and the improvement of incentive and penalty mechanisms, further elevate the comparability and credibility of disclosed data. Moreover, Mao Yue's case study demonstrates that the mandatory disclosure of data assets on balance sheets (for instance, classified accounting under "intangible assets" or "inventory") enhances information transparency and furnishes data support for high-quality development. Overall, mandatory ESG disclosure sets quantifiable benchmarks for green transformation and high-quality development. It provides empirical bases for governmental policy formulation and charts a clear course for corporate sustainable development. Consequently, it functions as a core institutional instrument linking the "dual-carbon" goals with high-quality economic growth.

3.7 Summary and Concluding Remarks

The establishment of a corporate ESG disclosure system is not merely a requisite response to the global sustainable development trends and the implementation of the domestic "dual-carbon" goals. Instead, it is an inherent requirement for enterprises to strengthen their compliance capabilities, align with capital markets, and attain high-quality development. Starting from clarifying the necessity of disclosure and proceeding to construct an institutional framework centered around "standards–supervision–incentives–implementation–driving mechanisms," the core aim is to shift ESG disclosure from passive compliance to proactive engagement, and from mere data accumulation to meaningful value communication. Looking to the future, with the continuous refinement of regulatory systems and the deepening of corporate practices, ESG disclosure will develop into a crucial link connecting enterprises, capital markets, and societal development. This will, in turn, provide sustained impetus for the green transformation of the economy and society.

4. Conclusions

This research has conducted a systematic investigation into the urgency of establishing a mandatory ESG disclosure system for enterprises, surpassing the demonstrably insufficient voluntary model. By critically synthesizing theoretical discourses and empirical data, we have meticulously outlined the necessity, feasibility, and proposed framework of a differentiated mandatory regime. The study confirms that although voluntary mechanisms have given rise to widespread problems such as data distortion, greenwashing, and the infringement of stakeholder rights, a carefully crafted, legally-based mandatory system is the essential route ahead. The central contribution of this work lies in remodeling the theoretical basis for mandatory disclosure by introducing "environmental information rights" as a fundamental human right, thus going beyond the traditional rationale of mere government intervention. Moreover, we have put forward a specific, multi-level institutional framework customized to industry risks and enterprise scale, bolstered by dynamic monitoring and a strong enforcement mechanism.

Our analysis lends substantial support to several pivotal propositions. Firstly, it affirms that mandatory ESG disclosure holds an irreplaceable edge in alleviating information asymmetry and safeguarding public goods, encompassing environmental integrity and intergenerational equity. This is crucial as information asymmetry can distort market mechanisms and undermine the long-term interests of society, while the protection of public goods is fundamental for sustainable development. Secondly, our findings reveal that a uniform, one-size-fits-all mandate for ESG disclosure is not only inefficient but also inequitable. This inefficiency stems from the diverse characteristics and capabilities of different entities, and the inequity lies in the disproportionate burden it places on various sectors. Consequently, it validates the imperative need for a differentiated approach. This approach should strategically focus on SISEs, whose operations have a significant impact on the overall ESG landscape, while simultaneously minimizing the excessive burden on Small and Medium-sized Enterprises (SMEs). SMEs, being the backbone of many economies, require a more tailored regulatory environment to ensure their continued growth and contribution to the economy. Thirdly, the research presents a comprehensive blueprint for institutional construction. It meticulously details the phased and sector-specific design of disclosure standards. The phased approach allows for a gradual and manageable implementation, while the sector-specific design acknowledges the unique ESG challenges and opportunities within each industry. Additionally, it emphasizes the synergistic combination of incentives and constraints. Incentives can encourage voluntary compliance and innovation, while constraints ensure that minimum standards are met. Moreover, it underscores the essential integration of these elements into the legal framework through specialized legislation and judicial reform. This integration is necessary to provide a solid legal foundation for the effective implementation of ESG disclosure requirements.

The practical significance of this research is manifest in its direct policy implications. It offers actionable recommendations for regulatory bodies in China and other major economies to enhance their ESG disclosure frameworks. By implementing these recommendations, these economies can foster a substantive green transformation, protect investors by providing them with more accurate and comprehensive information, and strengthen the underpinnings of a sustainable market economy. This not only benefits the environment and society but also contributes to the long-term stability and growth of the global economy.

Despite these contributions, this study does have certain limitations. The fact that it relies on secondary literature and publicly accessible data implies that some of the more subtle, context-dependent challenges encountered by enterprises, especially those in emerging economies, might not be comprehensively captured. Although the proposed differentiated framework is theoretically well-founded, its operational effectiveness and adaptability across various institutional settings necessitate further empirical verification through future case studies and large-scale applications. Finally, although the role of digital technologies has been recognized in the discussion, a more in-depth exploration is needed to understand how technologies such as blockchain and artificial intelligence can be systematically integrated into disclosure mechanisms to guarantee data integrity and traceability.

Looking ahead, the trajectory of ESG disclosure is clearly evolving from a voluntary initiative to a mandatory obligation, and from a compliance-oriented activity to a strategic imperative for value creation. In future research endeavors, cross-national comparative studies should be accorded the highest priority to validate the robustness of the differentiated disclosure model. Furthermore, it is crucial to delve into the synergistic effects of ESG disclosure in tandem with complementary policies such as carbon pricing and environmental taxation. Additionally, a rigorous assessment of the governance and standardization challenges arising from the digital transformation of ESG data is necessary. For China, it is of paramount significance to capitalize on the strategic opportunity presented by its "dual carbon" objectives to establish a comprehensive mandatory ESG disclosure system that not only aligns with international norms but also caters to domestic circumstances. Such a system will not only drive the green transformation of corporations but also enhance China's influence in shaping the global governance framework for sustainable development.

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