

How Do Organizational Empowerment and Management Control Jointly Promote ESG Value Co-Creation? A Longitudinal Case Study of Haier Smart Home Based on Public Disclosures

Zihan Yuan^{*}, Lirui Yu

Department of Accounting, Nanjing University of Science and Technology, Nanjing, Jiangsu, China

^{*} Corresponding Author Email: 1918276752@qq.com

Abstract. As sustainability disclosure becomes increasingly institutionalized in China, the managerial challenge is shifting from whether firms disclose ESG information to how ESG objectives are translated into executable, accountable, and measurable operating responsibilities. Prior research has mainly examined the economic consequences of ESG performance, while less attention has been paid to how empowerment and management control work together in decentralized organizations. This study conducts a longitudinal documentary single-case analysis of Haier Smart Home based on public disclosures. The period from 2005 to 2019 is treated as the organizational background, while the analysis focuses on the integration of ESG governance and operating management from 2020 to 2025. The findings suggest that the Rendanheyi-related arrangements of delegated authority, platform-based resource access, and value orientation provide organizational conditions for bringing ESG issues closer to business settings, although public disclosures do not directly establish changes in employees' psychological empowerment. More importantly, Haier Smart Home has increasingly translated selected ESG objectives into operating responsibilities through board oversight, cross-functional ESG structures, target decomposition, and performance incentives. Its 2024 ESG report, for example, discloses that selected ESG indicators are incorporated into monthly performance assessment and that recovery, dismantling, and regeneration targets in the resource-recycling business are linked to executive evaluation and compensation. Supply-chain management and appliance recycling further indicate that ESG tasks extend beyond firm boundaries, but the available evidence does not identify the net causal effect of platform mechanisms on ESG outcomes. Double materiality, metric definitions, and data verification constitute control boundaries for decentralized action, while sustainable finance indicates a possible, rather than established, resource-feedback mechanism. Based on these findings, the study proposes a project-level ESG Win-Win Value-Added Statement integrating responsibility ownership, baselines and boundaries, inputs, physical outputs, financial outcomes, environmental and social impacts, and verification status. The study contributes by integrating organizational empowerment and management control within a single accountability-oriented framework and by explicitly defining the evidentiary limits of a disclosure-based case study.

Keywords: ESG, organizational empowerment, management control, responsibility accounting, value co-creation, Haier Smart Home.

1. Introduction

Sustainability information is evolving from a corporate-image communication issue into a matter of corporate governance, risk management, and resource allocation. The Ministry of Finance and other authorities issued the Corporate Sustainability Disclosure Standards - Basic Standards (Trial), which require enterprises to establish a sustainability information management foundation centered on materiality, information quality, and governance responsibility [1]. The Shanghai Stock Exchange's self-regulatory guidelines for sustainability reporting and subsequent preparation guidance further strengthen disclosure requirements concerning governance, strategy, impact, risk and opportunity management, metrics, and targets [2, 3]. These institutional changes imply that ESG should not be treated merely as a year-end compilation of philanthropy, energy-saving, and employee

activities by a reporting department. Instead, it should enter the operating processes of strategy decomposition, responsibility centers, budgeting, performance evaluation, and internal control.

Chinese ESG research has accumulated substantial empirical evidence on firm value, financing costs, innovation, and operating performance. Zhang and Zhao [4] examine the relationship between ESG performance and firm value; Qiu and Yin [5] investigate ESG performance and financing costs; Li et al. [6] further explain the link between ESG and performance through the mechanism of corporate innovation; and Wang and Yang [7] empirically test mechanisms through which ESG affects firm value. Meanwhile, Huang [8] points to greenwashing and selective disclosure risks in ESG reporting, reminding researchers that corporate self-disclosure should not be equated with independently verified outcomes. These studies help answer whether ESG may create value, but they leave a question that is closer to management accounting: once ESG objectives enter the firm, who is responsible for them, how are resources obtained, how are managers evaluated, how are results measured, and how can local optimization and metric distortion under decentralization be prevented?

Haier provides an informative organizational setting for examining this question. Prior studies have analyzed Haier's organizational innovation from the perspectives of platform organization, decentralized management control, and digital empowerment. Zhu et al. [10] show that highly decentralized organizations require a combination of shared managerial philosophy, organizational segmentation, managerial accounting reports, and performance management to remain decentralized without becoming disordered. Wang et al. [11] examine how Haier's platform organization supports internal entrepreneurship, while Lin and Zhou [12] explain the evolution of Haier's innovation ecosystem through psychological, structural, and resource empowerment. Thus, empowerment, platforms, and control are not new findings in themselves. The question addressed here is different: when tasks extend from user value and business innovation to ESG issues that span time periods and organizational boundaries and cannot be fully monetized, how is the existing organizational logic re-embedded in responsibility allocation, performance evaluation, and value measurement?

Accordingly, this study asks: in a decentralized organization, how do organizational empowerment and management control jointly translate ESG objectives into accountable operating tasks and promote value co-creation across organizational boundaries? The study adopts a longitudinal single-case design based on public disclosures, taking Haier Smart Home Co., Ltd. as the primary unit of analysis. The evolution of Haier Group's Rendanheyi model is treated as the institutional context, but data from other business segments of Haier Group are not attributed directly to Haier Smart Home. The study makes two main contributions. First, it places organizational empowerment, responsibility decomposition, performance evaluation, and data verification within the same mechanism chain, showing that ESG value co-creation does not result from simply granting more autonomy but from the alignment of autonomy and accountability. Second, from a responsibility-accounting perspective, it proposes a project-level ESG Win-Win Value-Added Statement that highlights responsibility ownership, boundaries, baselines, inputs, impacts, and verification status, thereby reducing the risk of mechanically monetizing non-financial impacts or double-counting them with accounting profit.

The research problem is particularly relevant to large manufacturing firms because sustainability responsibilities are distributed across organizational and legal boundaries. A climate target may be set at the corporate level, but its operational realization depends on product engineers, procurement teams, factory managers, logistics providers, service networks, customers, recyclers, and sometimes financial institutions. The same dispersion occurs in social and governance issues. Occupational safety is experienced at the site level, supplier labor risks arise outside the focal firm, product accessibility is shaped by design and service decisions, and data-security responsibilities may cut across technology, marketing, and customer-service functions. A disclosure-oriented approach can aggregate these outcomes *ex post*, but management requires a different question: how can a firm make dispersed actors responsible for a common sustainability objective before the results are known? This question shifts attention from ESG as a reporting category to ESG as an architecture of decision rights, responsibility centers, measurement rules, and feedback mechanisms.

This shift also matters for management accounting. Traditional financial accounting is designed primarily to recognize transactions and economic events within defined reporting entities and periods. ESG initiatives frequently have different temporal and organizational characteristics. The cost of an energy-efficiency redesign may be incurred before the corresponding user savings are realized; a supplier capability-development program may produce benefits outside the focal firm; a recycling initiative may involve collected products, dismantling operations, regenerated materials, avoided waste, and resale markets that are not captured by a single financial margin. If management relies only on corporate-level ESG indicators, responsibility can become diffuse. If it relies only on accounting profit, managers may underinvest in outcomes whose benefits are delayed or shared. The relevant managerial task is therefore to connect non-financial objectives with responsibility assignment without weakening financial discipline.

The case of Haier Smart Home is useful because the company combines a long-standing decentralized organizational philosophy with an increasingly formalized ESG governance structure. This coexistence allows the analysis to move beyond a simple contrast between hierarchy and empowerment. The issue is not whether decentralization is preferable to control, but how a decentralized system can incorporate sustainability responsibilities that are often standardized, regulated, and subject to verification. In this sense, the paper treats empowerment and control as potentially complementary organizational technologies. Empowerment can bring information and initiative closer to operational problems, whereas management control can define non-negotiable boundaries, assign responsibility, establish comparable measures, and reduce the risk that local autonomy produces local optimization at the expense of corporate sustainability objectives.

The analysis deliberately adopts a conservative evidentiary stance. Public reports are valuable because they are dated, traceable, and available for longitudinal comparison, but they are written by the focal organization and may emphasize successful practices. Accordingly, this study separates observable organizational arrangements from inferred behavioral effects. When a report states that an ESG indicator is included in monthly performance assessment, the paper treats the inclusion as an observable control arrangement. It does not infer that the arrangement necessarily changed employee motivation, improved environmental outcomes, or increased firm value. When public materials describe a recycling network, the paper treats the network as evidence of cross-boundary coordination, not as proof that the platform mechanism caused the reported volume. This distinction between direct evidence and analytical inference is central to the paper's contribution and to the interpretation of all subsequent findings.

2. Literature Review and Analytical Perspective

2.1. ESG Value Creation: From Economic Consequences to Organizational Processes

Stakeholder theory emphasizes that a firm's continuing operation depends on multiple parties, including employees, customers, suppliers, governments, and communities [15]. Value co-creation theory further argues that value is not produced unilaterally by the firm but emerges through interactions between the firm, users, and other participants [16]. The resource-based view and the natural-resource-based view suggest that organizational routines, relational resources, reputation, and environmental management capabilities may become sources of competitive advantage [17, 18]. ESG value creation, therefore, should not be understood as a mechanical aggregation of environmental, social, and governance indicators. It is a process through which firms reorganize resources around environmental externalities, stakeholder relationships, and governance responsibilities.

Existing empirical research generally supports an association between ESG and value-related outcomes, although the results vary with industry materiality, institutional settings, measurement choices, and endogeneity [4-7, 19-22]. Khan et al. [20], in particular, emphasize differences in the financial materiality of sustainability issues. For a case study, this implies that contemporaneous improvements in revenue, profit, or financing arrangements cannot be attributed directly to ESG, nor should the number of activities reported by a company automatically be interpreted as evidence of

value creation. This study therefore distinguishes among organizational actions, process outputs, value outcomes, and possible resource feedback.

The literature on ESG value also reveals an important distinction between outcome-oriented and process-oriented explanations. Outcome-oriented studies typically estimate whether firms with stronger ESG performance exhibit different market valuations, financing costs, innovation outcomes, or operating results. Such designs are indispensable for establishing broad regularities, but the mechanisms they imply are often compressed into firm-level variables. A high ESG score may reflect many different internal arrangements: centralized compliance, decentralized experimentation, supplier governance, incentive redesign, data-system investment, or combinations of these elements. Two firms with similar reported ESG performance may therefore rely on very different organizational processes. For managers, this heterogeneity matters because an association at the firm level does not specify which responsibilities should be delegated, which controls should be centralized, or which data should be verified at the project level.

A process perspective complements rather than replaces economic-consequence research. It asks how sustainability issues are noticed, translated, funded, implemented, measured, and reviewed. This sequence is especially important when an issue is cross-functional. Product energy efficiency, for example, may require a change in design specifications, procurement standards, production settings, marketing claims, and after-sales information. Supplier responsibility may require screening, on-site review, remediation, and follow-up. Circular-economy projects may require collection, transportation, dismantling, material recovery, and downstream reuse. In each case, ESG performance is not produced by a single department but by a chain of interdependent decisions. The organizational process that connects these decisions is therefore part of the causal story behind ESG outcomes.

This process orientation also helps clarify the meaning of value co-creation. The term should not be used merely to describe a situation in which many stakeholders are present. Co-creation requires a form of interdependence in which different actors contribute resources, information, capabilities, or behavioral changes to a shared outcome. Users may contribute information about needs and usage conditions; suppliers may contribute material innovation or emissions data; employees may contribute local process knowledge; recyclers may provide collection and dismantling capabilities; financial institutions may condition capital on sustainability objectives. The focal firm coordinates these contributions, but it does not unilaterally produce all of the resulting value. This makes responsibility attribution and value measurement inherently more complicated than in a conventional internal project.

2.2. Organizational Empowerment: Distinguishing Structural Conditions from Psychological States

Empowerment research generally distinguishes structural empowerment from psychological empowerment. Structural empowerment concerns the allocation of decision rights, information, resources, and responsibility, whereas psychological empowerment concerns employees' subjective perceptions of meaning, competence, self-determination, and impact [13, 14]. The two are related but cannot substitute for one another. Public corporate disclosures can reveal formal delegation, platform resources, training, and performance arrangements, but they rarely provide direct evidence that employees' perceived meaning, autonomy, or self-efficacy has changed.

Haier's Rendanheyi model organizes responsibility units around user value and restructures conventional hierarchical relationships through platforms, micro-enterprises, chain groups, and value sharing [10-12]. These arrangements can be regarded as structural conditions through which ESG tasks enter operational settings: actors closest to users, products, equipment, and suppliers may possess richer local information and may be better positioned to mobilize resources around specific problems. Empowerment, however, does not automatically generate sustainable outcomes. If responsibility units are evaluated only on short-term revenue and profit while product energy use, supplier responsibility, or circularity are excluded from their accountability, decentralization may instead amplify responsibility externalization. Accordingly, this study does not treat stronger

psychological empowerment as an empirically established case finding. It focuses on the observable link between structural empowerment and management control.

The distinction between structural and psychological empowerment is important for both theory and method. Structural empowerment refers to organizational conditions that can, at least in principle, be documented: delegation of decision rights, access to information, availability of resources, formal responsibility, and channels through which actors can obtain support. Psychological empowerment concerns how individuals interpret those conditions. An employee may be granted authority but still perceive little autonomy if performance expectations are ambiguous or punishment risks are high. Conversely, an employee may feel strong ownership over a task even when formal authority is limited. Because the current study does not contain employee interviews or survey measures, it would be methodologically inappropriate to infer psychological states from organizational descriptions. The paper therefore uses empowerment primarily as an observable structural concept and treats psychological responses as a plausible but unverified micro-level pathway [13-14].

A second distinction concerns empowerment as discretion versus empowerment as capability. Delegating a decision is not sufficient if the responsible unit lacks technical knowledge, budget access, data, or cross-functional support. In sustainability settings, this problem can be acute because issues such as carbon accounting, supplier due diligence, product safety, and materials circularity require specialized knowledge. A decentralized responsibility unit may recognize a problem but remain unable to solve it without platform resources. Haier's platform and chain-group logic is relevant in this respect because it suggests that empowerment can be organized through shared resources rather than through isolated autonomy. The analytical focus of this study is therefore not simply whether authority is decentralized, but whether the organizational structure reduces the distance between a sustainability problem and the resources required to address it.

A third distinction concerns empowerment and accountability. In some managerial narratives, empowerment is presented as the removal of control. From a responsibility-accounting perspective, such a view is incomplete. Greater discretion increases the need to specify the outcomes for which the empowered actor is accountable and the boundaries that cannot be traded away for short-term performance. In ESG settings, these boundaries can include safety requirements, anti-corruption standards, product-quality thresholds, data protection, and supplier compliance. Empowerment is therefore most sustainable when it is accompanied by clear responsibility objects, measurable expectations, and escalation procedures. This complementarity becomes central in the case analysis.

2.3. Management Control and Responsibility Accounting: Embedding ESG in Operating Accountability

The value-creation role of management accounting lies not only in recording outcomes but also in translating strategic objectives into responsibilities, budgets, metrics, and feedback. Xie and Ao [9] discuss the historical expansion of management accounting from cost control and decision support toward value creation. In their study of Haier and Kyocera, Zhu et al. [10] further show that highly decentralized organizations require shared managerial philosophy, stand-alone accounting information, and performance management to sustain coordination. ESG makes this problem more complex. Environmental and social impacts often cross both firm boundaries and accounting periods, while value may simultaneously appear as user energy savings, supplier capability development, environmental improvement, and corporate financial outcomes. Without clear responsibility attribution and boundary definitions, double counting becomes likely.

Based on this literature, the study develops an analytical perspective consisting of structural empowerment, responsibility embedding, cross-boundary co-creation, and measurement control. Structural empowerment asks who is close to the problem and able to mobilize resources; responsibility embedding asks who bears an ESG task and how performance is evaluated; cross-boundary co-creation asks how the firm connects suppliers, users, recyclers, and other actors; and measurement control asks how baselines, metric definitions, and verification procedures are

established to prevent local optimization. Outcome-to-resource feedback is treated only as a possible extension and is not assumed *ex ante* to form a completed reinforcing loop.

Responsibility accounting provides a useful language for linking these dimensions. Its traditional logic assigns controllable revenues, costs, investments, or other performance variables to responsibility centers. ESG expands the set of objects that may require responsibility without eliminating the underlying accountability principle. A manager responsible for a recycling program, for example, may need to be evaluated not only on expenditure but also on collection volume, qualified dismantling, recovered materials, compliance incidents, and project economics. The design challenge is to distinguish what the manager can control from what is influenced by external actors, and to separate outcome indicators from the activities intended to produce them. Without that distinction, an ESG scorecard may reward high activity volumes without demonstrating that the intended environmental or social effect occurred.

Management control also addresses temporal trade-offs. Many ESG investments impose current costs while their operational, reputational, or risk-reduction benefits are realized over longer periods. If decentralized units are assessed only on short-term financial margins, they may rationally avoid projects whose benefits are shared or delayed. Conversely, if sustainability indicators are insulated completely from economic discipline, projects may continue without sufficient attention to efficiency. A workable control system must therefore combine short-term operational measures with longer-horizon objectives, while making explicit which impacts are financial, which are physical, and which remain uncertain. The project-level statement proposed later in the paper is designed around this separation rather than around the assumption that every impact can be converted into a monetary value.

2.4. Integrated Analytical Framework: Empowerment, Accountability, and Control

The integrated framework used in this study begins with a simple premise: ESG objectives become operational only when they are attached to actors, resources, measures, and consequences. External regulation and stakeholder expectations create issues that the firm must interpret. Structural empowerment determines whether actors close to the issue can recognize and mobilize a response. Responsibility embedding determines whether that response is formally owned, assessed, and connected to incentives. Cross-boundary co-creation determines whether resources outside the focal organizational unit can be coordinated. Measurement control determines whether the resulting actions remain comparable, traceable, and aligned with corporate boundaries. These elements are analytically distinct, but they interact in practice.

The framework differs from a linear stage model. Structural empowerment may precede formal ESG responsibility in historical terms, as in Haier's organizational evolution, but in ongoing operations the mechanisms can operate simultaneously. A supplier-related problem may be identified by procurement personnel, escalated to a specialized ESG chain group, translated into an audit or remediation requirement, and reviewed through quantitative indicators. The same project may then generate new information that changes procurement criteria or training needs. Thus, the framework is better understood as a set of mutually reinforcing organizational functions than as a fixed sequence.

The framework also distinguishes enabling conditions from verified effects. Structural empowerment is an enabling condition because it can improve access to local information and resources, but the study does not assume that every empowered unit will identify sustainability opportunities or that every identified opportunity will create value. Responsibility embedding is observable when a task has a defined owner, metric, period, and performance consequence, but the existence of such a control does not establish its causal effectiveness. Cross-boundary co-creation is observable when multiple parties participate in a sustainability task, but it does not establish that the focal firm created all resulting value. Measurement control is observable through governance, definitions, targets, reviews, and verification arrangements, but the reliability of every reported number cannot be inferred without independent assurance.

These distinctions generate three expectations that guide the empirical analysis. First, decentralized organizational arrangements should matter for ESG only when they connect problem recognition with resource mobilization. Second, ESG objectives should become more operationally consequential when they are decomposed into responsibility units and linked to periodic assessment. Third, the value of decentralization should depend on measurement and boundary controls that reduce the risks of local optimization, responsibility shifting, and indicator manipulation. Outcome-to-resource feedback remains a theoretically plausible extension, but this study requires direct evidence of resource reallocation before describing such feedback as an established loop.

Table 1. Positioning of This Study Relative to Prior Haier Research

Research theme	Representative study	What prior research mainly explains	What this study further examines
Platform organization and entrepreneurial support	Wang et al. [11]	How platform organization provides resources and structural support for internal entrepreneurship	How intertemporal and cross-boundary ESG responsibilities enter an existing platform structure
Decentralized management control	Zhu et al. [10]	How decentralized organizations remain coordinated through managerial accounting and performance management	How ESG metrics enter responsibility decomposition, performance assessment, and data verification
Digital empowerment and ecosystem evolution	Lin and Zhou [12]	How psychological, structural, and resource empowerment shape innovation-ecosystem evolution	Which empowerment mechanisms are supported by public disclosures and which psychological mechanisms still require employee-level evidence
Economic consequences of ESG	Zhang and Zhao et al. [4-7]	Relationships between ESG and value, financing, innovation, and operating performance	How ESG objectives become accountable operating tasks inside an organization

3. Research Design

3.1. Research Method and Case Boundary

This study addresses a how-type mechanism question involving organizational arrangements, accountability relationships, and longitudinal change, for which case-study methods are appropriate [23, 24]. Because the evidence is drawn mainly from public corporate disclosures rather than interviews or internal archives, the research design is more precisely described as a longitudinal documentary single-case study based on public disclosures. Documentary analysis is not treated as equivalent to an ethnographic or interview-based case study capable of reconstructing all internal action processes.

The observation period is 2005-2025. The years 2005-2019 are used primarily to describe the organizational background in which Rendanheyi, micro-enterprises, platforms, and chain groups took shape, based mainly on peer-reviewed studies [10-12]. The core analytical period is 2020-2025, during which the study tracks ESG governance, responsibility decomposition, performance evaluation, supply-chain management, and resource recycling in Haier Smart Home's CSR/ESG reports, annual reports, and other public materials. The unit of analysis is strictly limited to Haier Smart Home Co., Ltd. and entities within its reporting boundary. Haier Group is used only as the source of the Rendanheyi model and as a supplementary source of public information.

The temporal split is substantive rather than merely convenient. The earlier period is used to reconstruct the organizational infrastructure that existed before ESG became a more formalized governance language. The later period is examined for evidence that sustainability objectives entered governance, performance management, and cross-boundary operating processes. This design avoids a common problem in retrospective case research: projecting a mature control system backward and

interpreting earlier organizational innovations as if they had originally been designed for contemporary ESG requirements. In the present paper, decentralization and platformization are treated as antecedent organizational conditions whose later use in ESG governance must be demonstrated rather than assumed.

The choice of a single case is also theoretically motivated. Haier Smart Home is not selected because it is assumed to be representative of all Chinese manufacturers. It is selected because the coexistence of a distinctive decentralized organizational model and extensive sustainability disclosure creates a revelatory setting in which the interaction between empowerment and control can be examined over time. The analytical objective is therefore mechanism refinement rather than statistical generalization. Transferability depends on whether other organizations face comparable problems of dispersed knowledge, cross-boundary responsibility, and the need to combine local discretion with standardized accountability.

3.2. Data Sources and Evidentiary Levels

To control for the bias inherent in corporate self-disclosure, this study does not substitute data volume for evidentiary independence. Evidence is divided into three levels. Level A consists of regulatory rules, listed-company annual reports, and ESG reports and is used to confirm governance arrangements, responsibility mechanisms, performance systems, and quantitative metrics. Level B consists of company website materials that supplement project processes and business settings, but these materials remain corporate self-disclosures. Level C consists of peer-reviewed academic studies used to reconstruct the early organizational background and to position the case theoretically. Because most Level A and Level B evidence still originates from the same corporate group, the study describes the procedure as cross-checking multiple types of documents rather than as fully independent triangulation.

Table 2. Data Sources, Purposes, and Evidentiary Boundaries

Evidence level	Main materials	Primary purpose	What the evidence can support	What it cannot support on its own
A	Ministry of Finance/SSE rules; Haier Smart Home ESG reports and annual reports [1-3, 25-30, 33]	Governance, responsibility, performance, and quantitative metrics	That a particular system, metric, or disclosed fact existed in a given year	Actual implementation effects, employees' subjective psychology, or net causal effects
B	Haier website materials on recycling and sustainable finance [31, 32]	Supplementary project processes and business settings	Processes, participants, and project arrangements described by the company	Project benefit-sharing, external partners' actual experiences, or independently verified environmental benefits
C	Peer-reviewed academic studies [4-24]	Theoretical framework, historical organizational background, and comparison with prior studies	Established theories and prior empirical evidence	Direct substitution for first-hand evidence on Haier Smart Home during 2020-2025

3.3. Analytical Procedure and Rules of Evidence

The study applies theory-guided documentary analysis. First, an event log is constructed using the fields time, actor, ESG issue, responsibility, resource, control, outcome, and evidence source. Second, recurring events are grouped into four themes: structural empowerment, responsibility embedding, cross-boundary co-creation, and measurement control. Third, changes in accountable actors, performance constraints, and interorganizational boundaries are compared longitudinally. Fourth, counterevidence and evidentiary gaps are recorded for each mechanism claim. Deterministic language is used only when public documents directly support the existence of a system or action; claims involving employee psychology, resource feedback, and financial causality are qualified with terms such as may, provides conditions for, or remains to be verified.

This approach also means that the paper does not claim to have conducted a complete interview-based Gioia analysis, nor does it invent double coding or inter-coder reliability statistics. Public disclosures have the advantage of traceability and replicability, but companies may selectively disclose successful practices. The strength of each conclusion must therefore be aligned with the strength of the underlying evidence.

The analytical process follows four additional reliability rules. First, dates are preserved when comparing governance structures or performance arrangements so that later practices are not treated as timeless organizational attributes. Second, the analysis distinguishes policy statements from operating mechanisms. A stated commitment to sustainability is not coded as responsibility embedding unless the disclosure identifies a responsible actor, evaluation arrangement, or other operational consequence. Third, outcome measures are classified according to what they actually represent. Training coverage is treated as an activity or process measure rather than direct evidence of capability improvement; supplier-audit coverage is treated as evidence of governance reach rather than proof that supplier risk has declined; recycling volume is treated as a scale measure rather than a complete measure of net environmental benefit. Fourth, missing project-level financial or impact data are recorded as evidentiary gaps rather than replaced by company-level revenue or profit.

This classification is important because corporate sustainability reports combine different types of information. Governance structures, targets, activity statistics, outcome indicators, policies, and narratives may appear on adjacent pages even though they have different evidentiary meanings. Treating them as equivalent would inflate the strength of a mechanism claim. The study therefore uses corporate disclosures as evidence of what the firm reports having institutionalized or achieved within a stated measurement boundary, while reserving causal language for relationships that can be supported by the documentary sequence and by explicit responsibility arrangements.

3.4. Credibility, Alternative Explanations, and Documentary Limitations

Credibility in a disclosure-based case depends less on the volume of documents than on the discipline with which competing explanations are handled. For example, the presence of a sustainability-linked loan may indicate that sustainability objectives have entered a financing contract, but changes in financing costs can also reflect market rates, borrower credit quality, lender competition, and other contractual terms. Similarly, rising recycling volumes may reflect policy incentives, consumer replacement cycles, network expansion, market demand for recycled materials, or operational improvements in addition to organizational design. The paper therefore avoids attributing company-level financial or operating trends exclusively to empowerment or ESG governance.

The documentary method also creates an asymmetry in what can be observed. Formal governance arrangements and quantitative indicators are relatively visible because firms are expected to disclose them. Informal conflict, failed experiments, bargaining among units, and employee perceptions are much less visible. This asymmetry can bias analysis toward formalized success. To mitigate that problem, the paper treats the absence of direct evidence as analytically meaningful. Where public documents do not disclose incentive weights, budget reallocations, project economics, or stakeholder-side outcomes, the paper identifies these as unresolved questions. The proposed management-accounting framework is partly motivated by these gaps: it specifies the data that would be needed to evaluate a project more rigorously.

Finally, the analysis separates descriptive validity from causal validity. Descriptive validity concerns whether a reported structure, indicator, or process existed according to the public record. Causal validity concerns whether that structure or process produced a particular outcome. The evidence is much stronger for the former than for the latter. As a result, the empirical sections use language such as provides an organizational condition, embeds responsibility, or extends the task boundary when the documents support those claims, while statements about motivation, performance improvement, or resource feedback are explicitly qualified. This approach allows the case to generate theoretical insight without exceeding the evidence available.

4. Case Evolution: From Organizational Foundations to ESG Responsibility Embedding

4.1. 2005-2019: Decentralization and Platformization as the Organizational Foundation for ESG Action

Since 2005, Rendanheyi has supported Haier's evolution from a conventional hierarchy toward responsibility units located closer to users. Prior research shows that Haier uses micro-enterprises, platforms, chain groups, value sharing, and managerial accounting tools to support autonomous operation, while shared managerial philosophy and performance mechanisms maintain organizational coordination [10-12]. For this study, the significance of this period is not that Haier had already developed a mature ESG system, but that it created three organizational conditions later available for ESG governance. First, responsibility units were positioned closer to users and operating sites, allowing local information to enter decisions more readily. Second, platform structures enabled resources to be connected across R&D, procurement, manufacturing, and service. Third, operating outcomes were linked to responsibility evaluation, providing an institutional interface through which ESG metrics could later be incorporated into accountability units.

It is important to distinguish the earlier language of user value, entrepreneurship, and ecosystem value-added from ESG in its current institutionalized sense. The years 2005-2019 are therefore treated as the organizational foundation rather than as a period in which mature ESG mechanisms had already been established. This avoids projecting the governance architecture of 2024-2025 backward onto earlier practices.

From the perspective of later ESG integration, the significance of this organizational foundation lies in the location of information and responsibility. Sustainability problems often originate as operational signals rather than as abstract ESG categories. A service technician may observe repeated product-use difficulties; a procurement team may encounter supplier quality or compliance concerns; a factory team may identify energy or material waste; a product team may receive requests for lower operating costs or improved accessibility. In a conventional hierarchy, these signals may require multiple reporting layers before resources can be mobilized. A structure built around user-facing responsibility units potentially shortens that path. The case does not prove that every such signal became an ESG initiative, but it identifies an organizational architecture capable of supporting later sustainability task formation.

The platform dimension is equally important. Decentralization can create fragmentation if each unit must build its own technical, financial, procurement, and data capabilities. The prior Haier literature describes platforms as shared infrastructures that support entrepreneurial and operating units [10-12]. For ESG tasks, the same logic can reduce duplication when a responsibility unit requires specialized environmental, quality, compliance, or supplier-management expertise. This suggests that empowerment should not be interpreted as organizational isolation. A decentralized unit can remain highly dependent on common standards and shared professional resources.

The early period also highlights a potential tension that becomes more visible after ESG formalization. User value and financial value can often be assessed within relatively short operating cycles, whereas some sustainability outcomes materialize over longer horizons or accrue partly to external parties. A platform organization therefore needs additional mechanisms if it is to support issues such as emissions reduction, circularity, and supplier responsibility. The later introduction of ESG governance and performance indicators can be understood as an attempt to make these broader responsibilities more explicit within an organizational system originally centered on user value and entrepreneurial accountability.

4.2. 2020-2022: ESG Moves from Responsibility Activities into Governance Structures

Haier Smart Home's 2020 Corporate Social Responsibility Report presents green development, employee rights and interests, supply-chain responsibility, and governance alongside Rendanheyi [25]. By the 2022 reporting period, the company further disclosed an ESG committee, an executive

office/working group structure, and the inclusion of sustainability-related content in senior-management evaluation [26]. This change indicates that ESG was moving from dispersed responsibility activities toward a management object with identifiable governance actors, reporting channels, and performance requirements.

The key development in this period was not that improved ESG performance had already been demonstrated, but that the boundary of accountability was changing. ESG was no longer borne only by corporate social responsibility or reporting personnel; it was gradually entering the responsibility evaluation of management, functional departments, and business units. Supplier dual-carbon surveys, green management initiatives, and employee training also began to be disclosed through quantitative indicators [26], providing a foundation for later responsibility decomposition and data control.

This shift from responsibility activities to governance structure matters because it changes who must explain performance. Under a purely reporting-oriented arrangement, sustainability teams may collect information from business functions after decisions have already been made. Under a governance-oriented arrangement, managers responsible for business processes are increasingly expected to provide data, respond to identified issues, and participate in target achievement. The public documents do not provide a complete map of internal decision rights during this period, but the emergence of committees, offices, working groups, and performance references indicates that ESG was moving closer to formal managerial accountability.

The period also illustrates the gradual nature of institutionalization. Corporate sustainability systems rarely move from voluntary activity to fully integrated control in a single step. Governance bodies may be established before measurement systems are mature; indicators may be disclosed before they are linked to incentives; supplier surveys may precede systematic remediation and verification. Viewing the period as transitional avoids overstating the maturity of the system while still recognizing the organizational significance of repeated and increasingly structured ESG disclosure.

For management accounting, the important development is the creation of identifiable responsibility objects. Green development, employee responsibility, supplier management, and governance issues can be linked to business functions, but accountability remains weak unless the firm also specifies metrics, evaluation periods, and consequences. The 2020-2022 period therefore provides evidence of institutional entry rather than full responsibility closure. This distinction prepares the basis for interpreting the more specific monthly performance arrangements disclosed later.

4.3. 2023-2025: Deeper Responsibility Decomposition, Monthly Performance Assessment, and Cross-Boundary Tasks

The 2024 ESG Report provides the most important responsibility-accounting evidence in this study. The report states that, in light of business characteristics and ESG objectives, the company incorporated key indicators such as training completion, trade-in program effectiveness, anti-fraud investigations, quality losses, quality certification, and workplace safety into the monthly performance assessment of relevant managerial personnel. It also linked selected ESG indicators to executive compensation and decomposed core indicators down to members and key projects. In the resource-recycling business, executives assume responsibility for recovery, dismantling, and regeneration indicators; results are evaluated monthly and linked to executive compensation [27]. Compared with an earlier principle-level commitment to ESG, this arrangement contains four observable management-control elements: an accountable actor, a performance metric, a fixed evaluation period, and an incentive consequence.

The 2025 ESG Report indicates that the company further established an ESG Executive Committee under the Board ESG Committee and used an executive office and specialized chain groups to advance implementation [28]. The report continues to disclose the monthly performance arrangements linked to resource-recycling indicators. At the same time, circular economy, supplier audits, employee development, data security, and other issues are incorporated into ongoing

management through double materiality and quantitative metrics [28]. The key change during 2023-2025, therefore, is not simply that the company disclosed more ESG information, but that ESG responsibilities became more explicitly assigned and connected to performance feedback.

The monthly nature of the disclosed assessment is significant because it places at least some ESG indicators within an operating cadence rather than an annual reporting cadence. Annual sustainability targets can remain distant from day-to-day decisions if managers receive feedback only at year end. Monthly assessment creates the possibility of earlier variance recognition and corrective action, although the public reports do not disclose the full internal review process. From a management-control perspective, the existence of a shorter evaluation cycle indicates that selected sustainability measures have become part of recurrent managerial attention rather than being used solely for external reporting.

The resource-recycling example is especially informative because the indicators correspond to a physical transformation process. Collection, dismantling, and regeneration represent different stages of the circular value chain, and performance at one stage does not guarantee performance at another. Assigning these indicators to responsible executives creates a more traceable chain than an undifferentiated corporate target for circularity. Yet the available documents still leave important questions unresolved: the relative weight of each indicator, the baseline against which improvement is judged, the relationship between physical indicators and project profitability, and the distribution of responsibility among internal units and external partners. These unresolved questions motivate the project-level statement developed later.

The extension of ESG governance across specialized chain groups also suggests a hybrid form of coordination. Issues such as environment, supply chains, risk, governance, and Rendanheyi development require expertise that cannot be contained within a single operating unit. Specialized groups can provide standards and professional support while operating units retain responsibility for implementation. This arrangement is consistent with the paper's central argument that empowerment and control are not opposites. Local units require discretion to respond to specific operating problems, while the corporate ESG architecture provides common definitions, escalation routes, and accountability expectations.

4.4. Cross-Stage Synthesis: From Organizational Capacity to ESG Accountability

Taken together, the three periods show an evolution in the object of accountability. During the organizational-foundation period, accountability was primarily framed around user value and operating performance. During the governance-entry period, ESG issues acquired formal organizational owners and became part of managerial evaluation. During the latest period, selected ESG indicators were decomposed more explicitly and connected to monthly assessment and compensation. The longitudinal evidence therefore supports an interpretation of gradual responsibility embedding rather than abrupt organizational redesign.

This evolution also clarifies why the paper does not argue that Rendanheyi inherently generates superior ESG outcomes. The organizational model predates formal ESG governance by many years and was designed around broader user-value and entrepreneurial principles. What matters for the present study is that the model supplied structural features that could later be used for ESG purposes. Formal ESG governance, metrics, and performance arrangements were required to convert those structural features into explicit sustainability accountability. The case therefore illustrates organizational repurposing: an existing decentralized architecture is not replaced but is progressively linked to new categories of responsibility.

The cross-stage comparison further suggests that institutionalization involves both vertical and horizontal integration. Vertical integration connects the board, executive bodies, specialized groups, and responsible managers. Horizontal integration connects functions and external actors involved in specific issues. Sustainability management becomes more embedded when both dimensions are present. A purely vertical system may produce formal targets without sufficient local knowledge, while a purely horizontal network may produce innovative projects without consistent accountability.

The Haier Smart Home case provides documentary evidence that both forms of integration have become more visible over time.

Table 3. Evolution from Organizational Foundations to ESG Responsibility Embedding

Period	Organizational/governance characteristics	Mode of ESG embedding	Observable management-accounting change
2005-2019	Rendanheyi, micro-enterprises, platforms, chain groups, and value sharing [10-12]	ESG was not yet a unified management language; user orientation and resource-connection capabilities were primarily established	Responsibility units and managerial accounting tools created an interface for later ESG responsibility decomposition
2020-2022	ESG committee and executive arrangements gradually formed [25, 26]	Green, employee, supply-chain, and governance issues entered an integrated governance framework	ESG moved from a reporting issue toward management responsibility and performance evaluation
2023-2025	Global ESG execution structure, specialized chain groups, and double materiality [27, 28]	Key metrics entered monthly performance assessment; resource-recycling indicators were linked to executive evaluation and compensation	An accountable chain of actor-metric-period-incentive became observable

5. Mechanism Analysis: How Empowerment and Management Control Jointly Promote ESG Value Co-Creation

5.1. Structural Empowerment: Shortening the Distance between ESG Problems and Resource Mobilization

ESG issues in the home-appliance industry are distributed across product design, raw-material procurement, manufacturing energy use, logistics, product use, and end-of-life treatment. Designers possess information on energy efficiency and materials; procurement personnel are close to supplier risks; and service personnel directly observe user experience and trade-in needs. If all issues must be escalated through headquarters, local information may be lost in organizational transmission. Haier's existing platform, micro-enterprise, and chain-group structures offer an alternative way to organize resources, enabling actors closer to the issue to connect R&D, procurement, manufacturing, and service resources around user and business tasks [10-12].

Public disclosures, however, establish only that organizational structures and resource-support arrangements exist; they do not directly show that employees consequently experience stronger meaning, autonomy, or impact. Structural empowerment is therefore interpreted here as an organizational condition for ESG opportunity identification and resource mobilization, rather than as evidence that psychological empowerment has already occurred. This distinction prevents subjective employee states from being inferred directly from formal organizational arrangements.

The information advantage of structural empowerment can be understood through problem proximity. Many sustainability issues are context dependent: a design choice that reduces energy use may increase cost or affect product performance; a supplier requirement may be technically feasible for one category but difficult for another; a take-back program may perform differently across cities because of logistics density and consumer behavior. Actors close to these conditions possess tacit information that is difficult to codify centrally. Delegated responsibility can make that information more actionable, but only if the actor can access complementary resources. Thus, the relevant unit of analysis is not isolated discretion but discretion combined with resource connectivity.

Problem proximity also improves the possibility of converting broad ESG language into operational tasks. A corporate goal such as improving circularity has limited behavioral content until managers specify which products, materials, locations, and process stages are involved. Local responsibility units can help perform this translation because they understand the constraints of the specific business process. At the same time, local translation creates a risk that each unit defines the

problem in a way favorable to its own performance. This is why structural empowerment must ultimately be linked to standardized definitions and control boundaries.

The case therefore suggests a conditional proposition: structural empowerment is most likely to support ESG value co-creation when three conditions hold simultaneously. First, the relevant unit is close enough to the problem to possess useful local information. Second, the unit can obtain technical, financial, and cross-functional resources rather than merely receiving formal authority. Third, the sustainability objective is incorporated into the responsibility system so that local actors cannot ignore it in favor of short-term financial targets. The first two conditions concern empowerment; the third concerns control. Their combination explains why empowerment and control are treated as complements in this study.

5.2. Responsibility Embedding: Translating ESG Objectives into Assessable Operating Tasks

Only when empowerment is combined with responsibility embedding can ESG move from an additional task to a formal operating responsibility. The monthly performance arrangements disclosed in the 2024 ESG Report provide relatively strong evidence. Indicators relating to training, trade-in programs, and workplace safety are allocated to relevant managerial personnel; in the resource-recycling business, recovery, dismantling, and regeneration indicators are assigned to executives, evaluated monthly, and linked to compensation [27]. From a responsibility-accounting perspective, this system performs at least four translations: it decomposes corporate ESG issues into specific business indicators, identifies accountable actors, establishes a fixed evaluation cycle, and attaches performance consequences.

This mechanism is closer to substantive ESG integration than the mere establishment of an ESG committee. A committee demonstrates the existence of governance responsibility, whereas responsibility decomposition and performance evaluation show that ESG begins to shape the action boundaries of business managers. At the same time, the public evidence does not disclose the full weighting of indicators, bonus calculation formulas, project budgets, or before-and-after comparisons. It therefore cannot establish that performance linkage caused net improvements in recycling volume or safety performance. Responsibility embedding is treated as a verifiable institutional mechanism, while its performance effects remain an empirical question for future research.

Responsibility embedding can be decomposed into four design questions. The first is ownership: which manager or unit is answerable for the task? The second is controllability: which part of the outcome can reasonably be influenced by that actor? The third is periodicity: how frequently is performance reviewed relative to the operating cycle? The fourth is consequence: what happens when performance is above or below expectation? The 2024 disclosure provides relatively direct evidence on ownership, periodicity, and linkage to compensation for selected indicators. It provides less information on controllability, weights, and the exact performance consequence. This uneven visibility is important because a nominally assigned indicator may have weak behavioral significance if its weight is trivial or if the responsible manager lacks authority over key drivers.

A responsibility-accounting perspective also requires distinction between leading and lagging measures. Training completion, audit coverage, and project milestones are often leading or process measures. Injuries, emissions, complaints, recycling yields, and financial returns may be lagging outcomes. An effective ESG responsibility system should not rely solely on one type. Process measures are useful because managers can act on them before final outcomes are known, but they can become ritualized if completion is rewarded regardless of quality. Outcome measures are closer to ultimate objectives, but they may be affected by factors outside the responsible manager's control. A balanced set of measures is therefore needed to preserve both actionability and accountability.

The disclosed monthly assessment is also relevant to the concept of management by exception. When targets and actual performance are compared regularly, significant deviations can become triggers for investigation. The current documents do not reveal whether such variance analysis is performed in a formal accounting format, but the logic is consistent with responsibility accounting: a measure becomes managerially useful when it helps direct attention to deviations, supports

explanation, and leads to corrective action. The project-level statement proposed in Section 6 makes this logic explicit by requiring baselines, actual inputs, physical outputs, and verification status.

5.3. Cross-Boundary Co-Creation: Extending Internal Control to Supply Chains and Resource-Recycling Networks

A central difficulty of ESG value co-creation is that responsibilities and resources cross legal firm boundaries. Supply-chain carbon management requires suppliers to provide data and undertake corrective action, while circular economy initiatives require the participation of consumers, collection networks, dismantling plants, and users of regenerated materials. Haier Smart Home's public materials describe a resource-recycling chain of recovery-dismantling-regeneration-reuse and a recovery network that connects users and collection channels through online touchpoints, offline stores, service personnel, and logistics resources [31]. The 2025 ESG Report further discloses that more than 8 million used household appliances were recovered nationwide in 2025 and that cumulative recovery approached 30 million units, while also reporting continuing dismantling and circular-utilization capabilities [28].

On the supply-chain side, the 2025 ESG Report states that social-responsibility audit compliance management covered 95% of supplier procurement value, that new suppliers were subject to on-site audits, and that the company continued dual-carbon surveys of suppliers [28]. These facts show that the organizational boundary of ESG tasks extends from internal operations to suppliers and recycling networks, but they do not by themselves establish that platform and chain-group mechanisms caused the observed outcomes. Public disclosures provide no counterfactual, comparison group, or partner-side data. A more defensible conclusion is that platform-based and chain-group resource connections provide an organizational interface for cross-actor ESG tasks, while their net effect requires internal project data or comparative research.

Cross-boundary co-creation creates an attribution problem that is often hidden by aggregate ESG indicators. A recycling outcome may depend on consumer participation, collection-network reach, logistics capacity, dismantling technology, downstream material demand, and policy incentives. A supplier emissions reduction may depend on the supplier's own investment, technology providers, customer requirements, and market conditions. The focal company may coordinate or enable these changes without being the sole creator of the outcome. For this reason, the paper uses co-creation to denote coordinated contribution rather than unilateral ownership of value.

The accounting implication is that a project should record both responsibility and contribution. Responsibility identifies who is accountable for managing the focal task; contribution recognizes that other actors may provide essential inputs. This distinction can reduce two opposite risks. The first is responsibility dilution, in which the focal firm attributes poor outcomes to partners even when it has meaningful leverage over standards or selection. The second is value appropriation, in which the focal firm claims the full environmental or social benefit of an outcome generated jointly with users or suppliers. A project-level record of roles, inputs, and evidence can make both forms of attribution more transparent.

Cross-boundary tasks also create data-control challenges. Supplier and recycling data may originate in systems that the focal company does not directly operate. Definitions may vary across partners, geographic areas, and product categories. If the focal firm aggregates these data without clear validation rules, reported improvements may reflect inconsistent boundaries rather than real operational change. The organizational interface must therefore be accompanied by data protocols specifying what partners report, how evidence is retained, who reviews anomalies, and which estimates remain unaudited. This is where co-creation and control become inseparable.

5.4. Measurement Control: Establishing Boundaries between Autonomy and Accountability

High decentralization does not imply less control; rather, it changes the focus of control. ESG tasks require at least four layers of control. First, governance boundaries are established through the board and ESG committee, which determine material issues and oversight channels. Second, responsibility

boundaries allocate issues to managers, business units, and specialized chain groups. Third, measurement boundaries define metric calculation, organizational scope, time horizon, and baselines. Fourth, data boundaries establish review procedures for estimates, manual adjustments, and externally supplied data. Haier Smart Home's 2024-2025 ESG reports show a combination of double materiality, targets and metrics, monthly performance assessment, and supplier audits that is increasingly consistent with this control architecture [27, 28].

It is important not to label all metric-based management as interactive control. Public disclosures can demonstrate that metrics are assessed, committees periodically review ESG matters, and cross-functional structures exist. However, evidence that managers continuously debate strategic uncertainties, reallocate resources, and learn around those metrics would require internal meeting records or interviews. This study therefore describes the observable mechanisms more cautiously as results control, boundary control, and cross-functional coordination, without making a definitive claim about the intensity of interactive control.

Measurement control begins with the definition of the responsibility object. A target such as reduce emissions is incomplete unless the organization specifies the emission scopes, organizational boundary, period, baseline, and calculation method. Similar problems arise in training, supplier audits, recycling, safety, and diversity. A percentage can appear precise while remaining difficult to interpret if its denominator changes. For managerial use, definitions must therefore remain stable enough to support comparison or, when they change, be accompanied by an explanation of the change. The concern is not merely external reporting quality; unstable definitions also weaken internal accountability because managers cannot distinguish real performance changes from measurement changes.

Verification status is another essential control dimension. Some ESG measures are generated directly from operational systems, some are compiled manually, some depend on supplier submissions, and some are estimated using conversion factors or models. These sources do not have identical reliability. Management accounting can improve decision usefulness by identifying the provenance of each measure and the level of review it has received. A project statement that marks data as system-generated, internally reviewed, third-party assured, or estimated allows managers to calibrate how much confidence to place in apparent performance differences.

Measurement control must also guard against indicator substitution. Once a measure is linked to performance assessment, managers have incentives to improve the measured number. This can be productive when the measure is well aligned with the underlying objective, but it can produce distortion when the proxy is narrow. A unit may maximize recycling collection without regard to downstream material recovery; a supplier program may maximize audit completion without effective remediation; a training program may maximize attendance without improving capability. The solution is not to abandon metrics but to combine activity, outcome, and quality measures and to preserve qualitative review for complex issues.

The case further suggests that control operates at multiple levels. Corporate governance defines material issues and overarching boundaries; specialized functions provide methods and standards; operating managers own selected indicators; external partners contribute data and actions. Effective ESG control therefore resembles a layered system rather than a single scorecard. The management-accounting challenge is to maintain traceability across these layers so that a corporate indicator can be related, where feasible, to projects and responsibility units rather than remaining an aggregate figure detached from operating decisions.

5.5. Outcome-to-Resource Feedback: From a Closed-Loop Claim to a Relationship Requiring Further Verification

Sustainability actions may generate resource feedback through user recognition, reputation, partner relationships, and capital markets [19-22]. Haier Smart Home introduced a hybrid ESG financing framework and a sustainability-linked loan in 2024, showing that financing conditions can be institutionally connected to sustainability objectives [32]. The existence of such instruments,

however, does not mean that financing costs necessarily declined, nor does it demonstrate that the resulting funds were reinvested in training, circular-economy, or low-carbon projects and thereby strengthened a subsequent round of empowerment.

Accordingly, outcome-to-resource feedback is no longer treated as a fourth core mechanism that has been empirically verified. It is instead defined as an extension supported by factual signals but lacking project-level evidence on cash flows and resource reallocation. Future research would need data on loan pricing changes, earmarked use of funds, budget increments, and project reinvestment to establish a closed loop from ESG outcomes to resource acquisition, reinvestment, and renewed empowerment.

The distinction between possible feedback and verified feedback is theoretically important. Sustainability research often proposes virtuous cycles in which strong ESG performance improves reputation, stakeholder support, or financing access, which then enables further sustainability investment. Such a cycle is plausible, but each link requires evidence. A sustainable-finance arrangement establishes a contractual connection between financing and sustainability conditions; it does not by itself show that capital became cheaper, that incremental resources were created, or that managers redirected those resources toward the projects that generated the sustainability outcome. Treating the entire loop as observed would collapse several separate mechanisms into a single narrative.

For management accounting, verified feedback would require a resource-tracking perspective. Managers would need to identify which outcome generated or released a resource, how the resource was measured, who controlled its allocation, and whether it was committed to a subsequent sustainability initiative. Examples could include documented energy-cost savings reinvested in efficiency upgrades, verified financing savings allocated to green capital expenditure, or measurable waste-reduction savings used to fund circular-design work. The public case documents do not provide this level of tracing. Accordingly, the framework treats feedback as a research agenda rather than a confirmed finding.

5.6. Integrated Mechanism and Boundary Conditions

Integrating the findings, the paper identifies a mechanism of empowerment-control synergy rather than a simple empowerment effect. Structural empowerment reduces the informational and organizational distance between a sustainability problem and the people able to act on it. Responsibility embedding converts selected issues into accountable operating tasks. Cross-boundary coordination connects resources that lie outside the focal responsibility unit or the firm itself. Measurement control defines boundaries, supports comparability, and reduces the risk that local discretion undermines corporate objectives. The mechanism is therefore relational: each component becomes more useful when the others are present.

The mechanism has several boundary conditions. First, the ESG issue must be sufficiently identifiable to become an object of responsibility. Highly diffuse issues with weak measurement may remain difficult to assign. Second, the responsible unit must possess or be able to access the resources needed to influence the issue. Responsibility without capability becomes symbolic accountability. Third, the measure must be decision useful rather than merely reportable. If the metric does not capture the quality of the underlying outcome, strong incentives may worsen distortion. Fourth, corporate and external boundaries must be specified clearly enough that actors understand which effects are inside the project's responsibility and which require cooperation.

A fifth boundary condition is temporal fit. Some ESG tasks can be managed within monthly or annual cycles, while others require multi-year investment and learning. A control system that applies a short evaluation window to long-horizon outcomes may discourage necessary investment. Conversely, extremely long horizons can weaken accountability if managers cannot observe intermediate progress. The design response is to combine leading indicators, milestones, and ultimate outcomes in a hierarchy of measures. This is particularly relevant to decarbonization, capability development, and supplier transformation.

Finally, the mechanism depends on data integrity. Empowerment can increase the number of actors generating ESG information, which improves local relevance but also increases heterogeneity. As data move from operating units and external partners into corporate reporting, definitions, systems, estimates, and manual adjustments must be controlled. The same organizational model that decentralizes action therefore requires a relatively disciplined data architecture. This tension between decentralized action and standardized information is a central reason why responsibility accounting is a useful bridge between ESG governance and operations.

Table 4. Core Mechanisms, Direct Evidence, and Evidentiary Boundaries

Mechanism	Representative direct evidence	What can be inferred	What cannot be inferred
Structural empowerment	Prior studies on platforms, micro-enterprises, chain groups, and decentralized control [10-12]	Provides organizational conditions for business-side problem identification and resource connection	That employees' psychological empowerment necessarily increases or that ESG performance necessarily improves
Responsibility embedding	ESG metrics enter monthly performance assessment; resource-recycling metrics are assigned to executives and linked to compensation [27]	Selected ESG objectives have been translated into explicit operating responsibilities	The net causal effect of performance linkage on recycling volume, profit, or safety
Cross-boundary co-creation	Recovery-dismantling-regeneration-reuse chain; supplier audits and dual-carbon surveys [28, 31]	ESG tasks cross firm boundaries and involve multiple actors	That the platform mechanism itself is the sole or principal cause of improved outcomes
Measurement control	Double materiality, governance oversight, metric definitions, audits, and performance assessment [27, 28]	Empowerment is constrained by responsibility and data boundaries	The strength of internal interactive control or that all data have been independently assured
Resource feedback (to be verified)	Hybrid ESG financing framework and sustainability-linked loan [32]	External capital is institutionally linked to ESG objectives	That financing costs fell or that funds were reinvested to strengthen the next round of empowerment

6. Management Accounting Extension: A Project-Level ESG Win-Win Value-Added Statement

6.1. Why a Project-Level Tool Is Needed Instead of a Firm-Level Indicator Checklist

Traditional responsibility accounting uses cost centers, profit centers, and investment centers as its principal objects and emphasizes financial accountability within organizational boundaries. ESG projects, by contrast, are simultaneously intertemporal, cross-boundary, and multidimensional. Current R&D and training expenditures may generate future benefits; supplier emission reductions and user-phase energy savings occur outside the reporting entity; and environmental improvement, employee capabilities, and user safety cannot always be monetized reliably. A firm-level list of ESG indicators cannot answer who is responsible, how much is invested, what baseline defines improvement, or to whom the resulting value should be attributed.

This study therefore extends the value-creation and value-sharing logic embodied in Haier's win-win value-added statement [10] into a project-level ESG Win-Win Value-Added Statement. The purpose is not to create a new external financial statement, but to turn ESG issues into responsibility-accounting objects that connect tasks, actors, inputs, outputs, impacts, financial feedback, and verification status within the same project. Environmental and social impacts may be recorded in physical units or through reasonable estimates, but they must be presented separately from accounting profit so that estimated social value is not mechanically recognized as corporate profit.

The project level is chosen because it is closer to managerial controllability than the corporate level. A corporate carbon indicator or supplier-audit rate can be useful for governance, but it may be too aggregated for resource allocation. A project can define a more specific decision context: a product redesign, an energy-efficiency upgrade, a recycling network expansion, a supplier remediation program, or a workforce-safety initiative. Within that context, managers can identify responsible actors, a baseline, budgeted inputs, operational outputs, relevant stakeholder effects, and evidence sources. This does not eliminate attribution problems, but it makes them visible.

The proposed statement should therefore be understood as a managerial architecture rather than a standardized reporting form. Different projects will require different physical indicators and time horizons, but the underlying accountability questions remain stable. What problem is being addressed? Who owns the decision? Which actors contribute resources? What is the baseline? What inputs were committed? What outputs were produced? Which environmental or social effects are directly measured and which are estimated? What financial outcomes can reasonably be attributed to the project? What evidence supports each claim? These questions create a disciplined narrative around the numbers.

A further advantage of the project-level approach is that it allows uncertainty to be reported explicitly. Traditional management reports often favor point estimates, while ESG information frequently contains assumptions about future behavior, emission factors, life-cycle boundaries, or avoided impacts. Rather than hiding this uncertainty, the proposed statement can identify estimated measures, assumptions, and verification status. This prevents false precision and allows decision makers to distinguish a robust operating result from an indicative impact estimate.

6.2. Basic Structure of the Project-Level ESG Win-Win Value-Added Statement

Table 5. Prototype of a Project-Level ESG Win-Win Value-Added Statement

Module	Core fields	Management-accounting requirement
Responsibility definition	ESG issue, project name, responsibility unit, project owner, collaborating actors	Specify who can decide, who bears the outcome, and who supplies data so that responsibility is not blurred across ecosystem partners
Baseline and boundary	Baseline product/process, organizational boundary, time horizon, life-cycle stage	All claims concerning energy savings, emission reductions, and cost savings should state the comparison baseline to avoid boundary drift
Inputs and budget	Budgeted/actual R&D, equipment, labor, audit, recovery, and digital-system inputs	Distinguish capital expenditure from period expense and record budget variances and accountable causes
Physical outputs	Recovery volume, dismantling volume, regenerated-material output, energy use, emissions, safety, training	Record both absolute and intensity measures and state data source, estimation method, and review status
Financial outcomes	Revenue, cost, cash flow, verifiable savings, financing cost	Record only actual or prudently estimated results attributable to the project and disclose the attribution ratio separately
Stakeholder value	User energy savings, supplier capability, employee skills, community impacts	Prefer physical or non-monetary indicators where appropriate and avoid double counting with corporate financial outcomes
Sharing and reinvestment	Employee incentives, partner benefits, earmarked budgets, next-period resource allocation	Recognize a feedback loop only when explicit rules and actual allocation records are available
Verification status	Original business records, internal review, third-party assurance, author estimate	Distinguish assured, internally reviewed, and unaudited/estimated information in the same statement to improve traceability

6.3. Illustrative Application to the Resource-Recycling Business

The resource-recycling business is suitable for illustrating the proposed statement because public disclosures provide relatively clear information on responsibility and performance arrangements. According to the 2024 ESG Report, relevant executives assume responsibility for recovery, dismantling, and regeneration indicators; performance is evaluated monthly and linked to compensation [27]. Corporate public materials also describe a recovery-dismantling-regeneration-reuse circular chain [31]. A project-level responsibility unit can therefore at least construct a performance chain around recovery volume, compliant dismantling volume, and regenerated-material output.

Table 6. Illustrative ESG Win-Win Value-Added Statement for the Resource-Recycling Project

Field	Information available from public disclosures	Internal data still required
Responsible actor	Executives in the resource-recycling business assume recovery, dismantling, and regeneration indicators; monthly results are linked to executive compensation [27]	Specific responsibility-center level, indicator weights, and bonus calculation rules
Business chain	Recovery-dismantling-regeneration-reuse; online and offline recovery networks connect users to collection channels [31]	Contractual responsibilities, internal transfer prices, and partner benefit-sharing rules
Physical output	More than 8 million used household appliances were recovered nationwide in 2025; cumulative recovery approached 30 million units [28]	Compliant dismantling volume, regenerated-material output by product category, and project-level inventory flows
Environmental impact	The company discloses circular-utilization and carbon-reduction-related outcomes [28]	Baseline scenario, emission factors, virgin-material substitution, and third-party verification workpapers
Financial outcome	Public disclosures do not provide a complete project-level cost, revenue, and cash-flow statement	Acquisition cost of recovered appliances, dismantling and processing costs, regenerated-material revenue, capital expenditure, and payback period
Feedback and reinvestment	Public disclosures show links between ESG metrics, performance evaluation, and compensation [27]	Value-sharing amounts, earmarked budget increments, and records of next-period resource allocation

The value of Table 6 lies partly in making non-disclosed information visible as a data gap. Compared with using total corporate revenue or profit to claim that ESG creates value, this approach is more consistent with responsibility accounting: data that exist are recorded under a consistent definition; data that do not exist are explicitly marked as missing rather than being replaced by aggregate financial outcomes that cannot establish project-level causality.

The resource-recycling example also illustrates why physical flow information is indispensable. Collection volume is only the first step in the chain. A rigorous internal statement would distinguish products collected, products accepted for qualified dismantling, material recovery by category, regenerated-material output, inventories in process, residual waste, and downstream use. These quantities make it possible to identify where losses or bottlenecks occur. They also create a bridge to financial data because collection, transportation, dismantling, regeneration, storage, and resale have different cost and revenue implications.

A second layer concerns baseline selection. Environmental benefit cannot be interpreted from a recycling volume alone. Managers need to specify the counterfactual against which benefit is assessed. The relevant baseline might involve conventional disposal, use of virgin material, or a prior-period recovery process, depending on the decision. Different baselines can produce materially different estimates. For internal decision making, the objective is not to choose the most favorable baseline but to adopt one that is decision relevant, stable, and transparent. Changes in baseline should be documented so that apparent improvement is not confused with a methodological change.

A third layer concerns financial attribution. Revenue from regenerated materials may be observable, while avoided disposal costs or financing effects may require more judgment. The project statement should distinguish actual transactions from modeled savings. Where benefits are shared with partners or customers, the focal company should not automatically record the entire amount as its own value creation. Instead, the statement can show enterprise financial value separately from stakeholder value. This separation preserves the insight of value co-creation without compromising accounting discipline.

6.4. Implementation Protocol for the Project-Level Statement

Implementation can begin with materiality-based project selection. The firm should choose a limited number of ESG issues that are both strategically important and sufficiently traceable to operating processes. The purpose of a pilot is not to cover every sustainability indicator but to develop a reliable accountability chain. For a manufacturing company, suitable pilots may include product energy efficiency, resource recycling, high-risk supplier remediation, or occupational safety. Each project should have a named sponsor, an operating owner, finance participation, and clearly identified data providers.

The second step is to define boundaries before setting targets. The project team should specify the organizational units, products, locations, lifecycle stages, and time periods included. If supplier or user data are part of the project, the team should define how those data enter the calculation and what evidence is required. Baselines should be documented at the same time. Establishing the boundary first reduces the risk that managers change the denominator or scope after performance is known.

The third step is to map the causal chain from resources to outcomes. Inputs may include capital expenditure, operating expenditure, personnel time, supplier-development costs, data-system investment, and external services. Outputs describe what the project directly produces, such as audits completed, equipment installed, products collected, or employees trained. Outcomes capture the change the project seeks to influence, such as reduced energy use, improved material recovery, fewer safety incidents, or improved supplier compliance. Financial consequences should be recorded separately and linked to the causal chain only when attribution is reasonably supportable.

The fourth step is to establish review frequency and variance analysis. Some indicators can be reviewed monthly, while others may require quarterly or annual assessment. The review should compare actual performance with baseline and target, identify the drivers of material variances, and document corrective actions. Importantly, a favorable non-financial variance should not automatically be treated as a favorable financial variance, and vice versa. Management needs both dimensions to understand whether the project is effective and efficient.

The fifth step is to assign verification status. Operational system data may require internal control testing; supplier submissions may require sampling or documentation review; modeled environmental impacts may require technical assumptions and version control; externally assured indicators should be identified as such. A simple verification label can improve the interpretability of the statement by preventing users from treating all figures as equally certain.

The sixth step is to connect performance to incentives cautiously. An ESG measure should enter compensation only when the responsible manager can influence it, the definition is sufficiently stable, and gaming risks are understood. Where the outcome is long term, milestone-based measures may be more appropriate than immediate outcome targets. Where multiple actors contribute, shared objectives may be preferable to assigning the full outcome to one individual. The Haier Smart Home evidence shows that selected ESG indicators can enter monthly performance assessment [27-28], but the broader design principles must still be tailored to the controllability of each project.

Finally, the project statement should feed learning rather than function solely as a compliance record. At the end of an evaluation cycle, managers should identify which assumptions proved inaccurate, which data were difficult to obtain, which partnerships created bottlenecks, and which outcomes justify further investment. Only when a subsequent resource allocation is documented should the organization describe an outcome-to-resource feedback loop. In this sense, the statement

provides the information infrastructure needed to test the feedback relationship that remains unverified in the present public-data case.

7. Discussion

7.1. Theoretical Contributions: From Empowerment-Driven to Empowerment-Control Synergy

First, this study advances the organizational micro-foundations of ESG value creation from empowerment alone to the joint relationship among empowerment, responsibility, and control. Prior Haier research has already established the importance of platforms, micro-enterprises, and resource empowerment for organizational innovation [10-12]. This study further argues that, when tasks involve environmental and social responsibilities, structural empowerment provides only the conditions for problem identification and resource mobilization. For ESG to enter operating management, accountable actors, evaluation cycles, metric definitions, and performance consequences are also required. The monthly performance arrangements and resource-recycling responsibilities disclosed in the 2024 ESG Report provide relatively direct public evidence for this mechanism [27].

Second, the study strengthens the responsibility-accounting perspective on ESG. Conventional ESG research often treats firm-level ratings or disclosure indicators as explanatory variables [4-7]. The project-level ESG Win-Win Value-Added Statement instead requires responsibility boundaries and baselines to be specified before value outcomes are discussed. This approach is particularly relevant to circular-economy and supply-chain issues that cross firm boundaries, because the same environmental or social outcome may be jointly produced by the focal firm, users, and partners. Without responsibility and attribution rules, value is easily double counted.

Third, the study imposes methodological discipline on disclosure-based case research by explicitly aligning claims with evidentiary boundaries. Corporate reports are appropriate for verifying whether a system exists, how a metric is defined, and what outcome is publicly disclosed, but they cannot directly establish employee psychology, partners' actual benefits, or net causal effects. Reclassifying psychological empowerment and resource feedback from deterministic findings to relationships requiring further verification reduces the risk of over-interpreting corporate narratives, consistent with prior warnings about greenwashing and selective disclosure in ESG reporting [8].

These contributions refine rather than overturn existing theories. Stakeholder theory and value co-creation explain why multiple actors matter, but they do not by themselves specify how responsibility is assigned inside a decentralized firm. Empowerment theory explains how decision rights and perceived autonomy can enable action, but it does not guarantee that sustainability externalities will enter the decision frame. Management control theory explains how objectives are translated into targets and feedback, but control can become formalistic when local information and initiative are weak. By bringing these perspectives together, the case highlights an organizational complementarity: local discretion helps identify and address context-specific ESG problems, while accountability mechanisms prevent sustainability responsibilities from being displaced by local financial optimization.

The responsibility-accounting perspective also adds precision to the concept of ESG integration. Integration is often described broadly as embedding sustainability into strategy or operations. In this paper, integration has observable components: an issue is assigned to an actor or unit, a metric or milestone is defined, a review period exists, relevant resources can be mobilized, and the result enters a performance or governance process. Not every ESG issue must satisfy all of these conditions at all times, but the framework makes it possible to distinguish symbolic inclusion from deeper operating accountability.

A further theoretical implication concerns the relationship between decentralization and standardization. They are often treated as opposing design choices, but ESG management requires both. Action can be decentralized because local units possess context-specific information, while

measurement rules, governance boundaries, and key definitions remain standardized to support comparability and oversight. The case therefore supports a view of selective standardization: the firm standardizes what must be comparable and verifiable while allowing operating units discretion over how to solve local problems within those boundaries.

7.2. Practical Implications: The Scale of Empowerment Must Match the Capacity for Control

For manufacturing firms, what can be replicated is not the label micro-enterprise or chain group, but three underlying principles. First, material ESG issues should be assigned to specific accountable actors rather than remaining within a reporting department. Second, project leaders may be given discretion to mobilize resources only when baselines, boundaries, non-negotiable constraints, and data-review procedures are also specified. Third, firms should first build project-level responsibility statements in traceable settings such as product energy efficiency, resource recycling, and critical-supplier responsibility before extending the approach to a wider set of issues. The scale of empowerment should match data quality and internal-control capability; responsibility should not be decentralized where separate measurement and traceability are not yet feasible.

A particularly important distinction is between activity metrics and value outcomes. Training coverage indicates the scope of training activities, supplier-audit coverage indicates the reach of a management procedure, and recovery volume indicates the scale of circular operations. None of these measures, by itself, establishes capability improvement, risk reduction, or net environmental benefit. Only when firms further record baselines, remediation outcomes, cost changes, and verification status can ESG indicators become decision-useful management-accounting information rather than merely disclosure metrics.

Managers should also avoid the opposite mistake of waiting for perfect monetization before taking action. Some environmental and social effects cannot be valued reliably in monetary terms, especially at the project level. A responsibility system can still be rigorous if it records physical indicators, qualitative risk assessments, and verification status alongside financial measures. The key is to avoid mixing unlike measures into a single synthetic value number that appears more precise than the underlying evidence permits.

For finance functions, the practical implication is a broader role in ESG governance. Finance can contribute to baseline definition, budget control, variance analysis, attribution, and documentation without claiming ownership of technical sustainability judgments. Environmental specialists may determine emission factors; procurement specialists may assess supplier remediation; operational teams may own project execution. Management accounting can connect these inputs through a common accountability structure. This collaborative role is especially valuable in decentralized organizations where sustainability data originate from many units.

For internal audit and risk functions, the framework suggests focusing on traceability rather than merely on policy existence. Reviews can test whether reported ESG indicators reconcile to underlying records, whether responsibility boundaries are clear, whether manual adjustments are approved, and whether external partner data are subject to proportionate validation. Such controls improve both external reporting credibility and internal decision quality.

7.3. Boundary Conditions and Transferability

The case should not be interpreted as a universal blueprint for decentralization. Haier's organizational history, global scale, brand resources, and platform capabilities create conditions that smaller or more centralized firms may not share. The transferable insight is therefore not the terminology of micro-enterprises or chain groups but the design logic of matching local discretion with resource access and accountability. A smaller manufacturer could apply the same logic through cross-functional project teams, delegated budgets, and clearly assigned sustainability responsibilities without replicating Haier's organizational form.

Industry characteristics also affect transferability. Home appliances have significant product-use energy implications, complex supply chains, and visible end-of-life recycling issues. In service

industries, the material ESG issues and physical flows may differ substantially. The project-level responsibility principle remains relevant, but the metrics, boundaries, and partner relationships would need redesign. Therefore, the framework should be adapted around issue materiality rather than copied around sector-neutral indicators.

Institutional context is a further boundary condition. As Chinese sustainability disclosure rules become more formalized [1-3, 33], firms have stronger incentives to establish governance, materiality, target, and data processes. In jurisdictions or segments with weaker reporting requirements, similar systems may rely more heavily on investor expectations, customer requirements, or internal strategy. The organizational mechanisms examined here can still operate, but the sources of pressure and the degree of formalization may differ.

7.4. Implications for Future Empirical Research

The framework creates several testable research opportunities. One is to examine whether ESG indicators linked to operating managers produce different outcomes from indicators retained only at the corporate-reporting level. A multi-firm design could compare the depth of responsibility embedding and subsequent changes in specific operational measures. Another is to study how controllability affects the effectiveness of ESG incentives. Indicators that depend heavily on external partners may require shared or team-based incentives rather than individual targets.

A second opportunity is to investigate the quality of project-level ESG measurement. Researchers could examine whether firms that document baselines, organizational boundaries, verification status, and attribution rules produce more stable and decision-useful sustainability information. Internal records could make it possible to compare reported improvements with underlying operational data and to identify where measurement changes rather than operational changes explain apparent progress.

A third opportunity concerns the feedback mechanism that remains unresolved in this study. With access to internal budgets and financing data, researchers could trace whether verified ESG outcomes lead to lower costs, new capital, reputational benefits, or additional resource allocations, and whether those resources are reinvested in the same or related sustainability capabilities. Such process tracing would provide stronger evidence for or against the commonly assumed virtuous cycle between sustainability performance and organizational resources.

A fourth opportunity is comparative research on organizational design. Future studies could compare firms that use centralized sustainability departments with firms that assign ESG responsibilities directly to operating units, while controlling for issue materiality and regulatory exposure. Such comparisons could examine whether decentralization improves the speed with which local problems are identified, whether it increases measurement inconsistency, and whether stronger common data standards offset that inconsistency. This design would move the discussion beyond whether firms disclose ESG information and toward the organizational conditions under which sustainability information becomes actionable. It could also test whether the benefits of empowerment are nonlinear: too little discretion may delay response, while too much discretion without common boundaries may weaken comparability and accountability.

A fifth opportunity concerns the role of the accounting function itself. The present case indicates that sustainability responsibilities increasingly interact with performance assessment, but public disclosures do not reveal how finance professionals participate in target setting, budget approval, variance investigation, or project evaluation. Field studies could examine whether management accountants act mainly as data consolidators, as control designers, or as business partners in sustainability projects. Evidence on these roles would clarify how conventional accounting expertise in budgeting, controllability, internal control, and performance measurement can be adapted to ESG without displacing the technical expertise of environmental, safety, procurement, and human-resources specialists. This line of inquiry would also help determine whether a project-level ESG statement improves decisions because of the form itself or because it changes cross-functional conversations about responsibility and evidence.

8. Conclusions and Research Limitations

Based on Haier Smart Home's public disclosures, this study examines how organizational empowerment and management control jointly promote ESG value co-creation. Three relatively robust conclusions emerge. First, the decentralization, platform structures, and value orientation associated with Rendanheyi provide structural conditions for locating ESG issues closer to operating sites and connecting cross-functional resources, but public disclosures are insufficient to establish changes in employees' psychological empowerment. Second, a central development in ESG governance is responsibility embedding: board oversight and cross-functional executive structures provide governance boundaries, while monthly performance assessment, metric decomposition, and compensation linkage translate selected ESG objectives into accountable operating tasks. The resource-recycling business provides the clearest publicly disclosed chain of accountable actor, metric, period, and incentive. Third, supply-chain management and resource recycling show that ESG tasks are extending beyond firm boundaries, but the net effect of platform mechanisms, partner benefit-sharing, and outcome-to-resource feedback still require stronger evidence.

On this basis, the study proposes a project-level ESG Win-Win Value-Added Statement centered on accountable actors, baselines and boundaries, inputs, physical outputs, financial outcomes, environmental and social impacts, sharing arrangements, and verification status. The purpose of the tool is not to monetize all social value, but to improve the traceability and managerial usefulness of ESG information through responsibility accounting.

The study has three limitations. First, the evidence comes mainly from corporate public disclosures. Cross-checking them against regulatory documents and academic research cannot eliminate selective disclosure or success-case bias. Second, the absence of employee interviews, internal meeting records, and partner-side evidence prevents definitive claims about psychological empowerment, the intensity of interactive control, or stakeholders' actual benefits. Third, the lack of project-level cost, cash-flow, budget, and counterfactual data prevents identification of the net causal effect of ESG actions on financial performance. Future research may combine internal archives, interviews, and project-cost data for process tracing; conduct multi-case comparisons with peer firms; and use quasi-experimental or difference-in-differences designs to test the economic consequences of specific ESG management mechanisms.

Despite these limitations, the case offers a clear managerial conclusion. ESG integration should not be evaluated only by the number of indicators disclosed or the existence of a board committee. Deeper integration occurs when sustainability issues are attached to identifiable operating responsibilities, supported by resources, reviewed within recurring management cycles, and measured under transparent boundaries. In decentralized organizations, this does not require abandoning autonomy. It requires designing autonomy so that managers remain accountable for material environmental, social, and governance consequences that would otherwise fall outside conventional profit measures.

The analysis also reinforces a broader point for management accounting. Sustainability extends the domain of accountability, but it does not eliminate the need for disciplined measurement. On the contrary, cross-boundary and non-financial effects make definitions, baselines, attribution, and verification even more important. The proposed project-level ESG Win-Win Value-Added Statement offers one way to organize these requirements without pretending that all stakeholder value can be reduced to a single monetary total. Its usefulness ultimately depends on whether firms can connect the statement to real budgets, operational systems, managerial review, and resource-allocation decisions.

The Haier Smart Home case therefore supports a qualified view of ESG value co-creation. Organizational empowerment can create the conditions for local problem recognition and resource mobilization; management control can convert selected sustainability objectives into accountable tasks; cross-boundary coordination can extend action beyond the legal boundary of the firm; and project-level measurement can improve traceability. The evidence is strongest for the existence and evolution of these organizational arrangements and weaker for their net causal effects. Maintaining

that distinction is essential if sustainability case research is to contribute to both theory and managerial practice.

Acknowledgements

The authors gratefully acknowledge the academic support and research environment provided by the Department of Accounting, Nanjing University of Science and Technology. The authors also appreciate the institutional access to academic databases and public corporate disclosures that made this documentary case study possible. Any remaining errors or interpretations are solely the responsibility of the authors.

References

- [1] Ministry of Finance of the People's Republic of China, Ministry of Foreign Affairs of the People's Republic of China, National Development and Reform Commission, et al. Corporate Sustainability Disclosure Standards - Basic Standards (Trial). *Cai Kuai* [2024] No. 17, 2024. (in Chinese).
- [2] Shanghai Stock Exchange. Self-Regulatory Guideline for Listed Companies No. 14 - Sustainability Report (Trial). 2024. (in Chinese).
- [3] Shanghai Stock Exchange. Guideline No. 4 for Listed Companies - Preparation of Sustainability Reports, revised January 2026. 2026. (in Chinese).
- [4] Zhang L., Zhao H. Do corporate environmental, social and governance (ESG) performance affect firm value? Evidence from A-share listed companies. *Wuhan Finance*, 2019(10): 36-43. (in Chinese).
- [5] Qiu M., Yin H. Corporate ESG performance and financing costs in the context of ecological-civilization construction. *The Journal of Quantitative & Technical Economics*, 2019, 36(3): 108-123. (in Chinese).
- [6] Li J., Yang Z., Chen J., Cui W. The mechanism through which ESG promotes corporate performance: From the perspective of corporate innovation. *Science of Science and Management of S. & T.*, 2021, 42(9): 71-89. (in Chinese).
- [7] Wang B., Yang M. The impact mechanism of ESG performance on corporate value: Empirical evidence from Chinese A-share listed companies. *Soft Science*, 2022, 36(6): 78-84. (in Chinese).
- [8] Huang S. Greenwashing and anti-greenwashing in ESG reports. *Finance and Accounting Monthly*, 2022(1): 3-11. (in Chinese).
- [9] Xie Z., Ao X. Historical evolution and logical starting point of value creation in management accounting. *Accounting Research*, 2018(2): 3-10. (in Chinese).
- [10] Zhu B., Zhang M., Tong C. Innovation of management control systems in decentralized organizations: A dual-case study of Kyocera and Haier. *Management Accounting Research (China)*, 2020(6): 28-42. (in Chinese).
- [11] Wang F., Wang X., Zhang C. Ultra-modular platform organizational structure and customized entrepreneurial support: An embedded case study of Haier's transformation toward a platform organization. *Management World*, 2019, 35(2): 121-150, 199-200. (in Chinese).
- [12] Lin Y., Zhou J. Evolution of manufacturing enterprise innovation ecosystems from the perspective of digital empowerment. *Science & Technology Progress and Policy*, 2023, 40(19): 86-95. (in Chinese).
- [13] Conger J. A., Kanungo R. N. The empowerment process: Integrating theory and practice. *Academy of Management Review*, 1988, 13(3): 471-482.
- [14] Spreitzer G. M. Psychological empowerment in the workplace: Dimensions, measurement, and validation. *Academy of Management Journal*, 1995, 38(5): 1442-1465.
- [15] Freeman R. E. *Strategic Management: A Stakeholder Approach*. Boston: Pitman, 1984.
- [16] Prahalad C. K., Ramaswamy V. Co-creation experiences: The next practice in value creation. *Journal of Interactive Marketing*, 2004, 18(3): 5-14.
- [17] Barney J. Firm resources and sustained competitive advantage. *Journal of Management*, 1991, 17(1): 99-120.

- [18] Hart S. L. A natural-resource-based view of the firm. *Academy of Management Review*, 1995, 20(4): 986-1014.
- [19] Eccles R. G., Ioannou I., Serafeim G. The impact of corporate sustainability on organizational processes and performance. *Management Science*, 2014, 60(11): 2835-2857.
- [20] Khan M., Serafeim G., Yoon A. Corporate sustainability: First evidence on materiality. *The Accounting Review*, 2016, 91(6): 1697-1724.
- [21] Friede G., Busch T., Bassen A. ESG and financial performance: Aggregated evidence from more than 2000 empirical studies. *Journal of Sustainable Finance & Investment*, 2015, 5(4): 210-233.
- [22] Gillan S. L., Koch A., Starks L. T. Firms and social responsibility: A review of ESG and CSR research in corporate finance. *Journal of Corporate Finance*, 2021, 66: 101889.
- [23] Yin R. K. *Case Study Research and Applications: Design and Methods*. 6th ed. Los Angeles: SAGE, 2018.
- [24] Eisenhardt K. M. Building theories from case study research. *Academy of Management Review*, 1989, 14(4): 532-550.
- [25] Haier Smart Home Co., Ltd. 2020 Corporate Social Responsibility Report. 2021. (in Chinese).
- [26] Haier Smart Home Co., Ltd. 2022 Environmental, Social and Governance Report. 2023. (in Chinese).
- [27] Haier Smart Home Co., Ltd. 2024 Environmental, Social and Governance Report. 2025. (in Chinese).
- [28] Haier Smart Home Co., Ltd. 2025 Environmental, Social and Governance Report. 2026. (in Chinese).
- [29] Haier Smart Home Co., Ltd. 2024 Annual Report. 2025. (in Chinese).
- [30] Haier Smart Home Co., Ltd. 2025 Annual Report. 2026. (in Chinese).
- [31] Haier Group. Haier Recycling Debuts at AWE with the Home-Appliance Industry's First Full-Chain Closed-Loop System. March 14, 2024. (in Chinese).
- [32] Haier Group. First in the Asia-Pacific Home-Appliance Industry: Haier Smart Home Launches a Hybrid ESG Financing Framework. July 10, 2024. (in Chinese).
- [33] Ministry of Finance of the People's Republic of China, Ministry of Ecology and Environment of the People's Republic of China, Ministry of Foreign Affairs of the People's Republic of China, et al. Corporate Sustainability Disclosure Standard No. 1 - Climate (Trial). *Cai Kuai* [2025] No. 34, 2025. (in Chinese).