

# Xiaomi And ESG: Sustainable Development Practices and Challenges of Tech Enterprises

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**Abstract.** This study analyzes Xiaomi's ESG practices and challenges, reflecting broader issues for Chinese tech firms. Facing ESG investment trends and industry pressures like high energy consumption and data privacy, Xiaomi pursues sustainability. Environmentally, it targets 2040 carbon neutrality. Smart factories saved 23% energy, and bio-based materials cut product carbon footprints by 18%. However, supply chain emissions dominate (99.2% of total), and green products like premium-priced (40%) solar panels have low market penetration (5%), highlighting economic-environmental tensions. Socially, its "Elderly Mode" (120 million devices) aids digital inclusion, but Indian labor disputes and a €6.5 million EU data fine reveal cross-border governance gaps. In governance, only 30% of ecosystem partners have full-time ESG roles. The findings indicate that Chinese tech companies must deeply embed ESG into core strategy, shifting from compliance to strategic drivers via supply chain decarbonization, cross-border compliance integration, and quantitative tool development.

**Keywords:** Xiaomi, ESG, high energy consumption, data privacy, supply chain decarbonization, cross-border compliance integration.

## 1. Introduction

Against the backdrop of the booming global capital market, ESG investment has become an irresistible trend, profoundly affecting enterprises' value evaluation and development direction. This trend stems from dual backgrounds: at the practical level, the climate change crisis (e.g., the IPCC 2023 report indicates that global temperature rise is approaching the 1.5°C threshold), growing social inequality (World Bank data shows the global Gini coefficient reaches 0.7), and regulatory pressures (such as the EU's CSRD regulation mandating ESG disclosure) have forced enterprises to transform; at the academic level, the resource-based view and stakeholder theory jointly demonstrate the mechanism by which ESG builds enterprises' sustainable competitiveness, while the "ESG premium" hypothesis has further promoted it to become a core indicator for investment decisions [1-3].

As a representative of tech enterprises, Xiaomi Group has demonstrated its commitment and efforts to sustainable development in practicing the ESG concept. However, facing the complex and changing global environment and social responsibility requirements, Xiaomi also faces many challenges. In the environmental field, although Xiaomi has set a carbon neutrality target by 2040 and achieved remarkable results in energy saving in smart factories and application of bio-based materials, the problem of supply chain carbon emissions accounting for 99.2% remains severe. In addition, the low market penetration rate of green products reflects the difficulty in balancing environmental and economic development. In terms of social responsibility, Xiaomi has improved digital inclusiveness through initiatives like the "Elderly Mode," but incidents such as labor disputes in India and EU data fines have exposed shortcomings in cross-border governance. At the corporate governance level, issues such as insufficient establishment of full-time ESG positions in ecosystem chain enterprises and rising costs due to geopolitics have further highlighted challenges in collaborative governance.

## 2. Introduction to Xiaomi

Xiaomi Corporation, founded in 2010, is a global tech enterprise with a focus on smartphones, smart hardware, and the Internet of Things (IoT) platform, headquartered in Beijing, China. Adhering to the mission of "letting everyone in the world enjoy a better life through technology," it has built a "Smartphone × AIoT" strategic ecosystem, covering four major business segments: smartphones, smart home, internet services, and emerging smart electric vehicles. By 2023, Xiaomi ranked third in global smartphone shipments (with a 12.8% market share), its IoT platform connected over 1 billion devices, and MIUI had 582 million monthly active users, forming the world's largest consumer-grade smart hardware interconnection ecosystem.

In terms of business model, Xiaomi pioneered the "Iron Triangle" system of "hardware + new retail + internet services": hardware products adhere to high cost-performance (with an overall gross profit margin of about 17%), reducing intermediate costs through the integration of online hunger marketing and offline "Xiaomi Home" stores; internet services achieve value-added monetization through advertising, games, etc., relying on user traffic. Its unique ecosystem chain model has incubated over 400 enterprises, covering smart hardware, consumer goods, finance, and other fields, but only 30% of ecosystem chain enterprises have established full-time ESG positions, exposing shortcomings in collaborative governance.

In terms of internationalization, Xiaomi accelerated its global layout after entering the Indian market in 2014. In 2023, overseas revenue accounted for 49% of the total, with business in more than 100 countries. This expansion has also been accompanied by cross-border compliance challenges, such as labor disputes in India and EU data fines (€6.5 million), highlighting the "responsibility gradient" differences faced by tech enterprises in emerging markets.

In the field of sustainable development, Xiaomi proposed the "Zero-Carbon Philosophy" in 2022, committing to achieve operational carbon neutrality and 100% use of renewable energy by 2040. It has practiced environmental goals through the T8 smart factory (reducing energy consumption by 23%), carbon-neutral products (such as Xiaomi Band 8), and supply chain carbon management (covering 52 core suppliers). In 2024, Xiaomi was awarded the "China ESG Model Enterprise" for its ESG practices, and it is released group standard Carbon Management System Construction Based on the Integrated Ecosystem of Vehicles, People, and Homes provided a hard technology-driven carbon reduction paradigm for the tech industry.

## 3. Analysis of motivations for Xiaomi's ESG implementation

As a leading enterprise in the global consumer electronics field, Xiaomi's ESG practices have attracted much attention. Its ESG practices take "green and low-carbon, people-centered, and comprehensive empowerment of technology" as the core path, building industry benchmarks through AI energy efficiency management (e.g., 23% energy reduction in T8 smart factory), inclusive design (e.g., "Elderly Mode" covering 120 million devices), and circular economy (with a target of 38,000 tons of electronic waste recycling, achieving a 95.94% completion rate). It was awarded the "China ESG Model Enterprise" in 2024. However, its Scope 3 supply chain emissions account for 99.2%, only 30% of ecosystem chain enterprises have full-time ESG positions, and coupled with the dilemma of green product premiums (Mijia solar panels have a penetration rate of only 5% due to a 40% premium), it highlights the "innovation paradox" (chip process upgrades increase carbon intensity in manufacturing) and cross-border compliance risks (€6.5 million EU data fine, and India's labor standards are only 76% of Europe's). In the future, it needs to rely on the "integrated ecosystem of vehicles, people, and homes" strategy, deepen the supply chain carbon account system and ESG financial tool development (such as green supply chain financing), and collaborate with UNGC to build a cross-border certification system compatible with cost constraints, so as to solve the problems of ecological collaborative carbon reduction and quantitative responsibility gradient, and provide a "technology-ecology-institution" three-dimensional linked sustainable development paradigm for global tech enterprises.

#### 4. Analysis of Xiaomi's ESG implementation path

This study focuses on three core issues: first, tech enterprises struggle to balance environmental goals and economic efficiency through technological innovation; second, coping with regional conflicts in ESG standards during global operations; third, the impact of the ecosystem chain model on governance effectiveness. Through in-depth analysis of Xiaomi's ESG strategic framework, practical achievements, and existing challenges, the following core findings are obtained: Against the backdrop of the rise of ESG investment in the global capital market, practical factors such as the climate change crisis, growing social inequality, and strengthened regulation, together with academic support from the resource-based view, stakeholder theory, and the "ESG premium" hypothesis, have jointly made ESG a core indicator for measuring corporate sustainable development. For the tech industry facing challenges of high-energy-consuming manufacturing, data privacy risks, and supply chain ethics, Xiaomi Group's ESG practices have typical research value. This study analyzes its strategic framework and practical effects around the balance between technological innovation and environmental economy, response to standard conflicts in global operations, and governance effectiveness of the ecosystem chain model, revealing common contradictions and breakthrough paths in ESG governance of tech enterprises.

In environmental governance, Xiaomi has set a target of operational carbon neutrality by 2040. The AI energy management system in the Beijing Yizhuang Smart Factory has reduced energy consumption by 23%. On the product side, the use of 12% bio-based materials has reduced the full-life-cycle carbon footprint by 18%, and 52 core suppliers have been promoted to use renewable electricity. However, Scope 3 emissions from supply chain chip manufacturing and logistics account for as high as 99.2%, becoming the main obstacle to emission reduction; while Mijia solar panels have a market penetration rate of less than 5% due to a 40% premium, highlighting the contradiction between environmental goals and commercial feasibility. This phenomenon confirms the "innovation paradox" in ecological modernization theory - although chip process upgrades reduce equipment energy consumption, they significantly increase carbon intensity in the manufacturing process.

In social responsibility practices, Xiaomi has improved digital inclusiveness by covering 120 million age-friendly devices with the "Elderly Mode." Its 35% female employee ratio and 28% female ratio in technical positions are better than the industry average. However, labor disputes in Indian factories have exposed loopholes in overseas supply chain management, and a €6.5 million fine in the European market for data storage compliance issues reflects the complexity of cross-border privacy protection. From the perspective of institutional theory, corporate social behavior is driven by regulatory pressure and normative isomorphism, but the "responsibility gradient" between emerging markets and developed regions (e.g., labor standards in Indian factories are only 76% of those in Europe) highlights the urgency of building a cross-cultural governance framework. In addition, the controversy over the launch of disaster relief-themed phone cases alongside donations for the Henan floods has also raised questions about the boundary between commercialization and public welfare.

At the corporate governance level, Xiaomi has established a sustainable development committee, but the 33% ratio of independent directors is still lower than that of Apple; the ESG report discloses 203 indicators but does not incorporate the TCFD framework, affecting international rating recognition. Although 27 internal fraud cases were investigated and dealt with in 2023, corruption cases in the supply chain component procurement link increased by 15% year-on-year, and coupled with a 9% increase in chip inventory costs due to Sino-US technological controls, it exposed deficiencies in the governance system in risk response and supply chain resilience. Under the ecosystem chain model, only 30% of 90 enterprises have established full-time ESG positions, and the imbalance between collaborative governance efficiency and innovation speed has become a key challenge in ecological governance.

ESG ratings show that Xiaomi's MSCI rating rose to BBB in 2023, and its S&P CSA score ranked among the top 25% globally. Green product innovation and smart manufacturing energy efficiency constitute competitive advantages, but sub-items such as "supply chain labor standards" and

"electronic waste management" lag behind Samsung and Apple, and the product carbon footprint score is only 68% of the industry average. Based on this, the study proposes strategies such as deepening the construction of the supply chain carbon account system, building a social value quantification model, aligning with international standards, and innovating ESG financial tools, providing governance references for emerging market tech enterprises to balance cross-border compliance and cost constraints.

## **5. Challenges and recommendations for Xiaomi's ESG**

### **5.1. Ineffective supply chain carbon governance and technology conversion paradox**

Scope 3 supply chain emissions account for as high as 99.2% (78% from chip manufacturing and logistics), but only 30% of ecosystem chain enterprises have full-time ESG positions, making it difficult to trace emission reduction responsibilities. Meanwhile, green technologies face the innovation paradox - Mijia solar panels have a market penetration rate of only 5% due to a 40% premium, and although chip process upgrades reduce product energy consumption during use, they increase carbon intensity in the manufacturing process by 23%.

Incorporate Scope 3 emissions into the Group Standard for Supply Chain Carbon Management, and require 200 core suppliers to achieve an annual 5% reduction in carbon intensity by 2030 [4]. At the same time, cooperate with green supply chain financing tools (such as carbon emission right pledge loans) to solve the premium problem [5].

Expand the application of SU7 recycled aluminum from the current 30% to all product categories, reduce the cost of bio-based materials through mass production (currently causing an 18% product premium), and achieve the synergistic effect of cost reduction through technology and carbon reduction.

### **5.2. Cross-border compliance conflicts and imbalanced responsibility gradient**

There are significant differences in responsibility gradients between emerging markets and developed regions: labor standards in Indian factories are only 76% of the EU benchmark; the €6.5 million EU data fine exposes regional conflicts in privacy protection; geopolitics have increased governance costs, with Sino-US technological controls leading to a 9% increase in chip inventory costs and a 15% year-on-year rise in supply chain corruption cases [6].

Classify based on market maturity, set environmental, social, and governance (ESG) indicators (e.g., gradually raise labor standards in Indian factories to 85% of the EU benchmark), and jointly develop a cross-border certification cost-sharing model with the United Nations Global Compact (UNGC) [7].

- Strengthen data localization management: Establish an independent data compliance committee in the EU, and adopt blockchain technology to achieve traceable audits of private data [8] to reduce compliance conflict costs.

### **5.3. Lack of quantitative tools and data black holes**

ESG rating data has timeliness defects: the MSCI BBB rating does not reflect real-time technical ethical disputes (such as the SU7 incident), and the "electronic waste management" sub-item in the S&P CSA score lags behind the industry average by 32% (S&P Global, 2024); supply chain data depth is insufficient, with carbon emission disclosure covering only 52 core enterprises and lacking labor audit records of secondary suppliers [9].

It is recommended to develop a "Social Return on Investment (SROI)" indicator system to quantify the social benefits generated by the "Elderly Mode" covering 120 million devices and convert them into credit lines for corporate financing [10].

- Establish a real-time early warning mechanism: It is recommended to integrate MSCI dynamic database resources to build an automated early warning system. When the corruption case rate exceeds the set threshold (greater than 10%), the system will automatically initiate rectification procedures and require secondary suppliers to publicly disclose their carbon emission data [11].

Overall, Xiaomi's ESG practices demonstrate the exploration of Chinese tech enterprises in transforming from compliance response to strategic drive. Its innovations in green technologies and inclusive products have industry demonstration significance, but issues such as in-depth supply chain governance, cross-border compliance risks, and lack of quantitative tools still need to be addressed by deeply integrating ESG into the "integrated ecosystem of vehicles, people, and homes" strategy. This practice not only provides a path reference for tech enterprises to balance commercial value and social responsibility but also enriches the connotation of ESG governance in high-tech industry scenarios through the construction of a "technology-ecology collaborative carbon reduction" model at the theoretical level [12].

## 6. Conclusion

Xiaomi's ESG practices show that tech enterprises in emerging markets can build reusable paths through green technological innovation (such as AI energy efficiency management) and inclusive product design (such as age-friendly functions), while also needing to guard against systemic risks in supply chain carbon emission governance and cross-border compliance differences. Its experience verifies the universality of the "innovation paradox" in the tech industry (e.g., chip process upgrades increase carbon intensity in manufacturing) and enriches the connotation of ESG governance in the high-tech industry through the proposed "technology-ecology collaborative carbon reduction" model. However, the study has limitations: the particularity of the ecosystem chain model may weaken the universality of the conclusions; ESG ratings (such as MSCI BBB) and policies (such as Sino-US technological controls) are dynamic; the depth of supply chain carbon emission data disclosed by enterprises (such as the 99.2% proportion) is insufficient, affecting attribution accuracy. In the future, it should be deeply integrated into the "integrated ecosystem of vehicles, people, and homes" strategy, establish a supply chain carbon account and social value quantification model, and develop ESG financial tools to solve the green premium dilemma; at the same time, explore quantitative standards for "responsibility gradients" in emerging markets, verify the balance mechanism between ESG efficiency and innovation speed under the ecosystem chain model, and collaborate with international organizations (such as UNGC) to build a cross-border ESG certification system compatible with cost constraints. The Xiaomi case proves that only through three-dimensional linkage of technological innovation, ecological collaboration, and institutional adaptation can symbiotic development of commercial value and social responsibility be achieved in the high-tech industry.

Deeply integrate ESG into the "integrated ecosystem of vehicles, people, and homes" strategy, establish a supply chain carbon account system and a social value quantification model; develop ESG financial tools (such as green supply chain financing) to solve the green product premium dilemma. Explore quantitative standards for "responsibility gradients" in emerging markets and cross-cultural governance frameworks; verify the balance mechanism between ESG efficiency and innovation speed under the ecosystem chain model. Collaborate with international organizations (such as UNGC) to build a cross-border ESG certification system compatible with cost constraints.

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