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## E-Waste Management in India: Legal Complexity and Corporate Compliance in the Digital Age

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### Abstract

This article takes a closer look at how India manages its electronic waste through the lens of corporate compliance and the challenges of legal implementation. As the third-largest producer of electronic waste in the world, India has crafted a detailed regulatory framework centred around the E-Waste (Management) Rules, 2022. This marks a significant shift from traditional command-and-control methods to a more market-driven approach known as Extended Producer Responsibility (EPR) systems.

The analysis highlights some notable gaps between the ambitious goals of the regulations and their actual execution, especially when it comes to integrating the informal sector, enhancing enforcement capabilities, and coordinating across jurisdictions. While large multinational companies have put together thorough compliance strategies, smaller businesses often bear a heavier load, which can hinder the overall effectiveness of the system. The study also finds that India's regulatory approach is increasingly in line with international standards, such as the Basel Convention and OECD EPR guidelines, which could help the country better integrate into the global landscape.

Key takeaways suggest that effective e-waste management hinges on tackling three main challenges:

- (1) formalizing the informal sector that currently handles 90% of India's e-waste,
- (2) bolstering enforcement mechanisms across different state jurisdictions, and
- (3) creating strong verification systems for EPR credit trading.

In conclusion, the article emphasizes that corporations need to embrace proactive compliance strategies that go beyond just meeting the minimum regulatory standards and actively participate in shaping policy development. As regulations evolve towards circular economy

principles and harmonization with international frameworks, companies will need to adapt their strategies to stay ahead of multilateral trade changes and rising environmental standards.

**Keywords:** *E-waste management, Extended Producer Responsibility, environmental law, corporate compliance, regulatory implementation, informal sector, India*

## **The Magnitude of India's E-Waste Challenge: A Corporate Perspective**

India's journey with e-waste is a telling sign of its digital evolution, with the Central Pollution Control Board (CPCB) estimating that we generate over 1.6 million tonnes of e-waste each year.<sup>1</sup> This number is likely on the low side, as a staggering 90% of e-waste is processed by the informal sector, which often operates outside the reach of official data collection.<sup>2</sup> For businesses, this lack of clear statistics poses real challenges when it comes to understanding supply chain risks and crafting effective waste management plans.

Currently, only about 33% of e-waste is handled by formal recycling systems,<sup>3</sup> leaving a significant regulatory gap that could put companies at risk of liability under various environmental laws. This shortfall in infrastructure often forces businesses to turn to informal waste disposal networks, which, while trying to stay compliant, can inadvertently harm the environment.

From a corporate risk management standpoint, the prevalence of the informal sector introduces several serious vulnerabilities. Companies could find themselves in hot water under the Environment Protection Act, 1986,<sup>4</sup> for improper waste disposal, even if they hire third-party vendors. The principle of strict liability in environmental law means that corporations cannot absolve themselves of legal responsibility by outsourcing waste management to contractors who appear to comply with regulations.<sup>5</sup>

## **Legal Framework Evolution: From Command and Control to Market Mechanisms**

India's journey in regulating e-waste showcases a remarkable evolution in environmental law. The transition from the E-Waste (Management and Handling) Rules of 2011,<sup>6</sup> through the E-Waste (Management) Rules of 2016,<sup>7</sup> to the latest E-Waste (Management) Rules of 2022,<sup>8</sup> highlights a significant shift from strict command-and-control approaches to more market-driven compliance systems.

### **The 2022 Rules: A Game-Changer**

The E-Waste (Management) Rules of 2022, which took effect on April 1, 2023,<sup>9</sup> mark a pivotal moment in Indian environmental legislation. These new regulations set up a thorough digital

compliance framework that requires registration and reporting from all players in the supply chain which are the producers, recyclers, refurbishes, and other stakeholders. The rules also introduce several innovative legal concepts that will greatly influence how companies approach compliance:

**Digital Compliance Platforms:** The requirement for a centralized digital platform brings new legal responsibilities for ensuring data accuracy, real-time reporting, and transparency throughout the supply chain.<sup>10</sup> Companies now need to keep detailed audit trails that can hold up under regulatory scrutiny while maintaining data integrity across various jurisdictions.

**Extended Producer Responsibility (EPR) Credit Systems:** The introduction of tradable recycling certificates is a sophisticated market mechanism that allows companies to meet their EPR obligations by purchasing verified credits.<sup>11</sup> This system forges new legal relationships between producers and recyclers, extending contractual obligations beyond the usual vendor agreements.

**Collective Producer Responsibility:** The rules allow Producer Responsibility Organizations (PROs) to pool EPR obligations from multiple manufacturers, creating new legal entities with fiduciary duties to their member companies.<sup>12</sup> This collective approach introduces innovative liability allocation mechanisms that require careful contractual planning.

## **Jurisdictional Complexities and Enforcement Challenges**

The federal structure of the regulatory framework leads to significant jurisdictional confusion, creating compliance challenges for companies. While the Central Pollution Control Board (CPCB) oversees the digital platform and sets national guidelines, the State Pollution Control Boards (SPCBs) hold the primary enforcement authority.<sup>13</sup> This jurisdictional division gives rise to several operational and enforcement challenges:

**Regulatory Inconsistency:** States interpret and enforce regulations differently, which results in a patchy compliance landscape. Companies that operate in multiple states have to deal with varying enforcement styles while trying to stick to consistent national compliance standards.<sup>14</sup>

**Resource Constraints:** Many SPCBs don't have enough staff, technical know-how, or digital tools to effectively monitor compliance. This lack of capacity leads to enforcement gaps that some companies take advantage of, while others find themselves lost in regulatory uncertainty.

**Legal Remedies and Dispute Resolution:** The existing rules don't offer much clarity on how to resolve disputes, especially when it comes to credit verification, appealing penalties, and conflicts between states. This lack of clarity raises the risks of litigation and increases compliance costs for businesses.

## **The Informal Sector: A Regulatory Blind Spot with Legal Implications**

The fact that the informal sector is left out of India's e-waste regulatory framework is a major legal oversight that could have serious consequences for businesses. Informal operators are responsible for managing over 90% of the country's e-waste through unregistered aggregators and recyclers,<sup>15</sup> yet the 2022 Rules don't offer any way to bring them into the formal compliance fold. This oversight puts companies at risk in several ways:

**Supply Chain Liability:** If companies work with informal operators, either directly or through middlemen, they could face legal trouble under environmental laws, even if they're trying to follow e-waste regulations. The principle of joint and several liability means that corporations cannot absolve themselves of legal responsibility by claiming ignorance of downstream waste handling practices.

**Data Integrity Issues:** The activities of the informal sector are mostly undocumented, leading to significant holes in waste tracking and reporting systems. This lack of transparency can damage the credibility of the Extended Producer Responsibility (EPR) credit system and leave companies vulnerable to regulatory penalties for not reporting accurately.<sup>16</sup>

**Worker Protection Obligations:** Companies could also be held liable under labour laws and occupational health regulations if informal workers get hurt while processing waste related to their products. The lack of formal protective measures increases both legal and reputational risks for these businesses.

## **Corporate Compliance Strategies: Lessons from Industry Leaders**

Major multinational companies have really stepped up their game when it comes to compliance, going well beyond just meeting the basic regulatory standards. Take Samsung, Dell, and HP, for example; they've poured a lot of resources into take-back programs, building collection infrastructure, and ensuring transparency throughout their supply chains.<sup>17</sup> Their experiences offer some great lessons for shaping effective corporate compliance strategies.

## **Best Practices in EPR Compliance**

**Integrated Waste Management Systems:** Leading companies have developed comprehensive waste management ecosystems encompassing collection, transportation, processing, and disposal. These systems prioritize engagement with the formal sector while maintaining rigorous documentation and audit capabilities through technology-enabled tracking systems, including blockchain and IoT sensors for real-time monitoring of waste flows and processing activities.<sup>18</sup>

**Stakeholder Engagement:** Successful companies actively collaborate with regulators, civil society organizations, and industry associations to influence policy development and implementation. This proactive engagement helps them spot regulatory trends and shape enforcement priorities.

## **Challenges for Small and Medium Enterprises**

Small and medium enterprises (SMEs) are really feeling the pinch when it comes to compliance with the current regulatory framework. Limited resources, a lack of technical know-how, and not enough awareness of regulations create major hurdles for them. Many SMEs simply don't have the funds needed for thorough waste management systems, which means they often have to depend on informal networks that can lead to legal troubles.<sup>19</sup> The complicated nature of the framework puts SMEs at a disadvantage, especially those without dedicated compliance staff or legal expertise, resulting in competitive gaps that could ultimately weaken the effectiveness of regulations.

## **Public Engagement and Consumer Responsibility: The Missing Compliance Component**

Effective e-waste management really hinges on getting the public involved, but unfortunately, many consumers just aren't aware of the issues at hand. A lot of people end up stashing away old electronics forever or tossing them out in ways that aren't exactly legal, which ends up hurting companies trying to follow the rules. The 2022 Rules did include some ideas for awareness campaigns, but the follow-through has been pretty weak.<sup>20</sup> This lack of action leaves companies exposed, since how consumers act has a direct effect on how waste is collected and processed. To tackle this, businesses need to step up their game and invest in educating consumers, making sure their efforts align with the regulations.

## **Recommendations for Enhanced Corporate Compliance**

After diving deep into the regulatory landscape and industry practices, a few key recommendations stand out for boosting corporate compliance:

### **Legal and Regulatory Reforms**

**Statutory Clarity:** It's essential to revise the e-waste rules to clearly define who has enforcement authority, how disputes will be resolved, and how liability is shared among various stakeholders. This kind of clarity can help lower compliance costs and make regulations more predictable.

**Informal Sector Integration:** We should consider adding provisions that allow the informal sector to participate in the regulatory framework, complete with proper training, certification, and safety measures. This approach not only enhances environmental outcomes but also helps mitigate risks for corporations.

**Verification Standards:** We need to tighten up the requirements for independent third-party audits to combat fraud and maintain the integrity of the credit system. These standards should

come with penalties for false reporting and clear processes for revoking credits when necessary.

## **Corporate Strategy Enhancements**

When it comes to **Supply Chain Due Diligence**, companies really need to put in place thorough procedures for vetting their waste management vendors. This means conducting regular audits, ensuring compliance certifications are in check, and having solid contractual guarantees. It's also crucial that these procedures cover sub-contractors and downstream processors.

On the **Technology Integration** front, investing in tracking technologies and data management systems should be a top priority. This will help ensure accurate reporting and maintain transparency throughout the supply chain. Plus, these systems should be flexible enough to adapt to future regulatory changes and any expanded reporting requirements that may come up.

Lastly, for **Stakeholder Collaboration**, companies ought to actively engage with industry associations, government agencies, and civil society organizations. This collaboration is key to promoting clear regulations and effective implementation. The focus should be on developing industry standards and best practices that everyone can follow.

## **Future Outlook: Toward a Circular Economy Framework**

The future looks promising as India shifts towards a circular economy framework for managing e-waste. This approach focuses on preventing waste, extending the life of products, and recovering materials. To make this shift successful, we'll need some major changes in regulations and how companies strategize.

The next step in this regulatory journey involves integrating eco-design principles, setting standards for repairability, and implementing life cycle assessments. Companies should start gearing up for these changes by investing in sustainable design practices and creating robust product stewardship programs.

## **International Framework Alignment and Future Convergence**

The evolving regulatory landscape of e-waste management in India reflects a strategic alignment with international standards. This convergence positions India for enhanced global trade opportunities and environmental partnerships. By committing to the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes,<sup>21</sup> India is working to align its domestic regulations with global norms, particularly regarding waste categorization, treatment, and cross-border movement protocols.

India's move towards Extended Producer Responsibility (EPR) is a clear nod to the OECD's guidelines,<sup>22</sup> showing that the country is serious about adopting best practices recognized worldwide. This alignment opens doors for technology transfers, foreign investments, and knowledge sharing, all while helping Indian companies stay competitive in markets that demand high environmental standards.

Looking ahead, changes in international trade law, like potential agreements from the World Trade Organization on environmental goods,<sup>23</sup> could have a big impact on India's e-waste regulations. These agreements might lower tariffs on recycling technologies and set up standardized certification processes, which would further weave India's e-waste management into global supply chains. To stay ahead, companies will need to adapt their compliance strategies to these international shifts, ensuring they maintain their competitive edge in a world that's becoming more interconnected

## **Conclusion**

India's approach to e-waste management marks a significant step forward in environmental law, but there are still some serious hurdles to overcome. The shift from strict regulations to more market-driven methods has introduced new compliance responsibilities that demand a more sophisticated legal and operational response from businesses.

To successfully navigate this complex regulatory landscape, companies need to adopt proactive and integrated compliance strategies that tackle both the legal requirements and the practical challenges of implementation. This means investing in systems, processes, and capabilities that go beyond just meeting the minimum regulatory standards, while also actively engaging with stakeholders to influence policy development.

Key challenges like integrating the informal sector, ensuring consistent enforcement, and fostering public engagement require a coordinated effort from the government, industry, and civil society. Only by working together can India's e-waste management system reach its full environmental and economic potential, while also providing regulatory clarity for businesses.

Moving forward, it's essential to maintain an open dialogue between regulators and the industry, backed by strong compliance frameworks and meaningful environmental results. Companies that take on this challenge with enthusiasm will be in the best position to thrive in India's changing regulatory environment, all while contributing to sustainable development goals.

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