

EPR and Circular Economy Paper Series

The Total Cost of Compliance in Extended Producer Responsibility (EPR)

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Extended Producer Responsibility (EPR) frameworks place the financial and operational burden of managing end-of-life product waste on producers. This includes funding the collection, recycling, and disposal systems necessary to handle discarded products. The underlying principle is that producers, as the creators of these goods, are best positioned to internalize these costs into their pricing strategies and pass them on to consumers. For EPR systems to succeed, it is critical to establish fair and accurate cost structures for waste management. However, achieving this balance is often more challenging in practice than in theory.

EPR incentivizes producers to design products that are easier to recycle, free from toxic materials, and aligned with business models that minimize waste generation. Yet, many producers hesitate to fully embrace these responsibilities due to concerns about short-term profitability or uncertainties surrounding long-term cost implications. Compliance costs under EPR are not fixed; they fluctuate annually due to evolving regulatory frameworks, shifting market dynamics, and variations in recycling rates. This unpredictability complicates financial planning and pricing strategies for producers, making it difficult to forecast and incorporate these expenses effectively.

A significant challenge in EPR systems is the lack of clear guidance and standardised benchmarks for compliance costs at the product end-of-life stage. This gap often leads to a **“race to the bottom,”** where *producers opt for the cheapest—and often least effective—waste management solutions*. Such practices result in subpar collection and recycling systems, fostering malpractices like improper disposal, inadequate recycling, and environmental harm.

Accurately assessing the total costs of compliance is essential for several reasons. It ensures that producers allocate sufficient resources to meet their recycling and disposal obligations, prevents underfunding of waste management systems, and encourages innovations in product design that enhance circularity and sustainability. Moreover, it fosters accountability, transparency, and fairness within the system, ensuring that the responsibility for waste management is equitably distributed among all stakeholders. A well-structured EPR system eliminates malpractices, drives away free riders, and creates a level playing field for all participants.

However, determining these costs is a delicate balancing act. EPR fees must neither be excessively high, which could overburden producers, nor too low, which could undermine the effectiveness of waste management efforts. Striking this balance requires a thorough understanding of the financial dynamics involved in waste procurement, transportation, collection, recycling, and material recovery. It also necessitates careful consideration of the quality and quantity of waste being collected, and the costs or value of the recovered materials including Critical Raw Materials (CRMs).

To ensure the long-term viability of EPR systems, policies must create an environment where producers can seamlessly pass compliance costs on to consumers, including bulk buyers. This requires a nuanced understanding of the interconnected factors that influence the cost structure.

Factors Influencing Compliance Costs

1. **Geographical Spread of Collection Systems:** Wider coverage areas increase logistics and transportation costs, particularly in rural or remote regions where waste collection and transportation require additional resources.
2. **Types of Collection Channels:** The methods used such as door-to-door services, bulk consumer programs, repair centres, or aggregators directly impact costs. Efficient channels can reduce operational expenses but may require significant upfront investments.
3. **Collection Facilities Size:** Larger facilities may benefit from economies of scale but also incur higher maintenance and operational costs.
4. **Collection Channel Operating Costs:** Expenses related to running collection facilities, awareness campaigns, waste procurement, logistics, staffing, and training significantly influence overall costs.
5. **Consumer Participation and Asks:** The willingness of consumers to return products for recycling is crucial. In emerging markets, consumers often expect compensation exceeding the material value of the waste, creating a disconnect between expectations and reality. For example, while the material value of a discarded mobile phone might be \$0.3-0.5, consumers in emerging markets demand \$5-10 or more to surrender it for recycling.
6. **Volume of Waste:** Higher volumes increase transportation and processing costs but may justify economies of scale in sorting and recycling.
7. **Dismantling Efforts:** Certain waste types, particularly e-waste, require labour-intensive dismantling before recycling, adding substantial costs to the process.
8. **Recycling Technology:** Advanced recycling technologies improve efficiency and reduce costs but often require substantial investment, particularly in less developed regions.
9. **Value of Recyclable Fractions:** The market value of recyclable materials, such as aluminium, copper, or paper, can partially offset recycling costs, though price fluctuations impact economic viability.
10. **Recovery of Critical Raw Materials:** Efforts now need to be made to recover rare earths and other CRMs from the components such as permanent magnets, capacitors, solders, batteries, connectors etc. Valuable materials like rare earth metals or precious metals in electronics can offset some recycling costs, but the complexity and technology required for their recovery vary significantly.
11. **Hazardous Waste Management:** Waste containing hazardous materials, such as e-waste plastics with persistent organic pollutants (POPs) or cartridges, CFCs, and polyurethanes, requires specialized handling, increasing storage, transportation, and treatment costs.
12. **Non-Recyclable Waste Management:** Some waste fractions, such as flat monitor screens, cannot be recycled with current technology and must be stored to recover CRMs as and when technology becomes commercially viable.
13. **Risk Management:** Regulatory changes, market shifts, or operational failures can introduce unexpected costs that must be accounted for.

Given the complexity of these factors, market forces alone may not ensure the efficiency and fairness of EPR systems. Authorities can play a pivotal role by commissioning baseline cost studies to assess the total costs of compliance. These studies can serve as benchmarks for determining fair pricing within the EPR framework, preventing undervaluation in the market, and ensuring effective waste collection and recycling.

Cost of Monitoring Compliance: Who bears this cost?

An often-overlooked element in the total cost of compliance under Extended Producer Responsibility schemes is the expenditure incurred by regulators and local authorities in monitoring and enforcing compliance. These costs include staffing for audits and inspections, maintaining reporting systems, data verification, and managing non-compliance cases.

While producers are responsible for financing the collection and recycling of the products that they introduced on market, the cost of monitoring/audits is borne by the regulators. Much of the funding for compliance monitoring comes from general taxation rather than fees levied on producers. This creates a hidden subsidy, effectively shifting part of the financial burden from producers to taxpayers.

Unless these regulatory costs are internalised within the EPR framework, the system risks underestimating the true economic and administrative impact of compliance and may weaken the incentive for producers to invest in more efficient and transparent waste management practices.

Achieving a Balanced and Sustainable EPR Framework Through Accurate Cost Assessment and Equitable Responsibility

The total cost of compliance in EPR systems is a multifaceted challenge that requires a nuanced understanding of financial, operational, and environmental dynamics. Producers, as primary stakeholders, bear the responsibility of financing waste management systems, but this must be balanced against the need to maintain profitability, ensure fair pricing, and promote sustainable practices.

A well-functioning EPR system hinges on accurate cost assessments for waste collection, transportation, recycling, and disposal. Without clear benchmarks and standardized guidance, producers may resort to cost-cutting measures that compromise waste management quality, leading to environmental harm and inefficiencies. To address these challenges, a transparent and equitable framework is essential. Key steps include:

- 1. Conducting Baseline Cost Studies:** Authorities should assess total compliance costs, considering factors like geographical spread, collection channels, waste volume, hazardous material management, and recycling technology.
- 2. Promoting Consumer Participation:** Encouraging consumers to return waste through awareness campaigns, incentivization schemes, or regulatory measures is critical.
- 3. Investing in Advanced Recycling Technologies:** Adopting innovative technologies can improve efficiency and material recovery but requires significant investment, especially in underdeveloped regions.
- 4. Ensuring Equitable Cost Distribution:** EPR policies should enable producers to pass compliance costs to consumers fairly and transparently, ensuring shared financial responsibility.
- 5. Addressing Market Fluctuations:** EPR systems must accommodate variations in recyclable material values and recycling costs to remain viable in volatile markets.
- 6. Managing Risks and Uncertainties:** Robust risk management strategies are essential to mitigate regulatory changes, operational failures, and unforeseen events.

Conclusion

The success of EPR systems depends on collaboration among producers, consumers, regulators, and waste management operators. By accurately assessing compliance costs and creating a balanced framework, EPR systems can achieve their dual objectives of environmental sustainability and economic viability. This not only ensures responsible waste management but also drives innovation in product design, encourages circularity, and contributes to a more sustainable future.

In conclusion, the total cost of compliance in EPR is not merely a financial calculation but a multifaceted challenge that requires careful consideration of economic, environmental, and social factors. By addressing these complexities and fostering accountability and transparency, EPR systems can fulfil their potential as a cornerstone of sustainable waste management and resource conservation.

Series Overview

This paper is part of a short-paper series developed under the [Technical Advisory on Strengthening EPR in Asia](#), with the objective of advancing the circular economy. Each paper focuses on a specific issue related to EPR and the circular economy—such as product design, cross-regional learnings, high-quality recycling, cost of EPR compliance, prioritization of sectors, collection channels, and the inclusion of the informal sector in EPR systems. The purpose of these papers is to provide policymakers and advocates with concise, actionable guidance that can serve as a starting point for more detailed analysis and in-depth exploration.



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