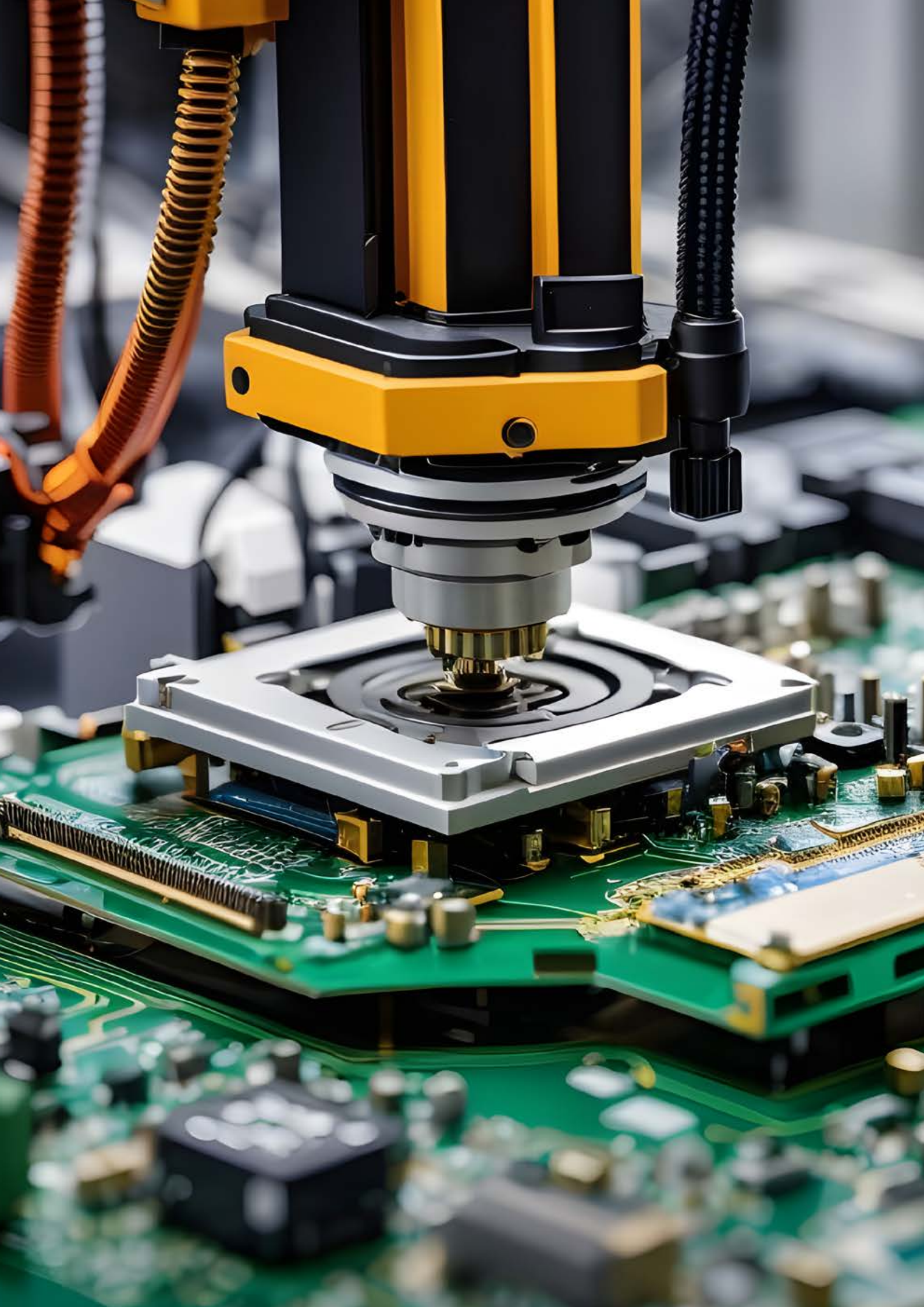
MAIT

Balancing Environment Protection with **Electronics Manufacturing in India**

Producer's Perspective



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Acknowledgment

The successful publication of this report, "Balancing Environment Protection with Electronics Manufacturing in India: Producers' Perspective" is a testament to the valuable contributions of numerous individuals and organizations. We owe immense gratitude to each one who played a role in bringing this crucial effort to completion.

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Our profound gratitude extends to each individual who contributed to this report. Their expertise, dedication, and willingness to lend support have shown this report the light of the day. Without your invaluable contributions, the publication of this report would not have been possible.

MAIT is proud to present this report as a resource for informed discussion and disseminating correct awareness on this critical topic for all stakeholders. We acknowledge that, despite our best efforts, inadvertent errors may remain. For any such shortcomings, we would like to mention that the environmental landscape is still evolving as we work on this report, but the purpose is to provide critical feedback and fix the inadequacies en route in accomplishing the greater good of the nation.

List of Abbreviations

S. No.	Full Form	Abbreviation
1.	Ministry of Environment, Forest, and Climate Change	MoEFCC
2.	Ministry of Electronics and Information Technology	MeitY
3.	Central Pollution Control Board	CPCB
4.	Standard Operating Procedure	SOP
5.	Plastic Waste Management	PWM
6.	Electronic Waste Management	EWM
7.	Battery Waste Management	BWM
8.	Information technology and communication	ITEW
9.	Standard Operating Procedures	SOP
10.	Open House Discussion	OHD
11.	Ease of Doing Business	EoDB

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Executive Summary

Executive Summary

In recent years, the government has demonstrated a steadfast commitment to sustainable development, as evidenced by initiatives such as Mission LiFE, Mission Circular Economy, and Swachh Bharat. This commitment is underscored by the implementation of robust environmental regulations, resulting in a notable year-on-year improvement in the effective management of e-waste, plastic waste, and battery waste.

The core objective has been to enhance both waste collection and recycling rates, as evidenced by a 36% increase in plastic packaging waste collection and a commendable 33% rise in recycling from 2019-20 to 2021-22. Similarly, e-waste collection experienced an impressive 43% growth, accompanied by a 29% increase in recycling during the same period. These achievements underscore the efficacy of the MoEFCC initiatives to fortify EPR compliance and promote sustainable waste management practices in India.

The core objective has been to enhance both waste collection and recycling rates, as evidenced by a 36% increase in plastic packaging waste collection and a commendable 33% rise in recycling from 2019-20 to 2021-22

Achieving a harmonious balance between sustainable development and electronics manufacturing is imperative, necessitating inclusive rule-making and effective implementation. Prime Minister Shri Narendra Modi's emphasis on both ecology and the economy resonate with this strategic approach. The Government of India envisions positioning India as a global hub for Electronics System Design and Manufacturing (ESDM), setting ambitious targets of $300 billion in electronics manufacturing and $120 billion in exports by FY 2026. This contributes significantly to the broader goal of a $1 trillion digital economy by 2025 constituting 20% of the predicted GDP.

Over the past two years, India has introduced new regulations for plastic, electronic, and battery waste management, incorporating substantial amendments, including the introduction of a new EPR regime. The release of notifications, memorandums, and Standard Operating Procedures (SOPs) in the past year has further shaped these regulations. Despite their overarching aim to promote environmental sustainability, the implementation has created a complex compliance landscape, posing challenges for businesses in terms of interpretation, adaptation, and adherence to these evolving rules.

The report identifies critical issues within the Plastic Waste Management Rules (PWM), E-Waste Management Rules (EWM), and Battery Waste Management Rules (BWM) that necessitate immediate attention. Industry stakeholders have encountered challenges due to limited consultation in policy formulation and operationalization, coupled with insufficient acknowledgment of submissions and concerns. Inconsistencies between the CPCB approaches have further burdened the industry in complying with these rules.

For example, delayed releases of SOPs, guidelines, and FAQs, coupled with impractical timelines, have impeded compliance with PWM, EWM, and BWM Rules. The recent implementation of Extended Producer Responsibility Rules (EPR rules) lacked feasibility consideration, resulting in

unrealistic targets and compliance systems that hinder the systematic evolution of the electronics manufacturing sector.

Internationally, a diverse range of waste management practices is evident. This is exemplified by the European Union (EU), where initiatives such as the Single-Use Plastics Directive of 2018 and the Packaging and Packaging Waste Directive of 2019 highlight a dedicated commitment to incorporating stakeholder input in the realm of plastic waste management. Similarly, Australia has showcased a comprehensive approach to battery waste management through inclusive consultations that engage a diverse array of stakeholders. This commitment ensures that a broad spectrum of perspectives, including those from associations, battery distributors, automotive companies, and energy retailers, contributes to the development of effective and well-rounded waste management strategies.

In conclusion, the report envisions a transformative future for India's electronics manufacturing industry by fostering a regulatory environment marked by collaboration, transparency, and adaptability. Recommendations include Stakeholder Training and Engagement, a coherent Approach to Regulations, a Consultative Approach in Rulemaking, and Institutionalization of Regulatory Impact Assessment (RIA). This approach aims to align economic development with environmental preservation, reflecting Prime Minister Shri Narendra Modi's vision for a balanced and sustainable future. The report not only diagnoses challenges but also charts a course toward a resilient and responsive regulatory framework, ensuring India's electronics manufacturing sector thrives amidst evolving global standards.

01

Introduction

1.1 Setting the context

Between 2019 and 2024, the MoEFCC significantly transformed India's EPR compliance system through key regulations and initiatives. The introduction of specific EPR targets and responsibilities in the February 2022, EPR Guidelines and the PWM Amendment Rules, 2023 marked notable milestones.

Efforts to improve collection and recycling rates, evidenced by CPCB data, include a 36% increase in plastic packaging waste collection and a 33% rise in recycling between 2019-20 and 2021-22. E-waste generation increased by 43% between 2017-18 and 2019-20[1], and recycling rose by 22.59% during 2016-17 to 2021-22[2], showcasing MoEFCC's success in enhancing EPR compliance. The MoEFCC replacement of the E-Waste (Management) Rules with the 2022 version aims for environmentally sound e-waste management, promoting a Circular Economy.

Efforts to improve collection and recycling rates, evidenced by CPCB data, include a 36% increase in plastic packaging waste collection and a 33% rise in recycling between 2019-20 and 2021-22

India has also implemented market-based Extended Producer Responsibility (EPR) regulations for plastic packaging waste, battery waste, e-waste, waste tyres, and used oil, setting targets for reuse, recycling, refurbishment, and recycled content use, fostering a circular economy. Global participation, such as in the Global Alliance for Circular Economy and Resource Efficiency (GACERE) and the Steering Committee of the International Resource Panel (IRP), underscores India's commitment to sustainable resource management.[3]

In tandem with the transformative initiatives, MoEFCC has aligned its efforts with the Swachh Bharat Mission, further emphasizing its commitment to comprehensive waste management. The Swachh Bharat Mission, launched by the Government of India, focuses on achieving universal sanitation and cleanliness, promoting hygiene practices, and effectively managing waste across the country. These collective efforts illustrate MoEFCC's dedication to environmental sustainability and resource efficiency in India.[4]

Parallelly, the government has been encouraging domestic manufacturing through programs and initiatives like Make in India (MII), Aatmanirbhar Bharat, Production Linked Incentive (PLI) schemes, Phased Manufacturing Programme, enhancing Ease of Doing Business (EoDB), among others. The political will towards EoDB was seen in the Budget 2022-23 announcements, which focused on

1 As told to Parliament (September 23, 2020): E-waste up 43% in 3 years. (2020). DownToEarth. Retrieved from https://www.downtoearth.org.in/news/agriculture/as-told-to-parliament-september-23-2020-e-waste-up-43-in-3-years-73512#:~:text=Published%3A%20Wednesday%2023%20September%202020&text=Electronic%20waste%20(e%2Dwaste),presented%20in%20the%20Lok%20Sabha.

2 Press India Bureau. (2024). Recycling of e-waste. Retrieved from https://pib.gov.in/PressReleaseIframePage.aspx?PRID=2004015

3 Rajya Sabha Unstarred Question No. 688, available at: https://sansad.in/rs/questions/questions-and-answers

4 Rajya Sabha, Unstarred Question No. 498, available at: https://sansad.in/rs/questions/questions-and-answers

simplifying compliance processes and enhancing the overall business climate. The recently enacted Jan Vishwas (Amendment of Provisions) Act, 2023,[5] which decriminalizes 183 provisions across 42 Central Acts administered by 19 Ministries and Departments, is a good example in this regard. These are in sync with the government's motto of 'Reform, Perform, and Transform.[6]

Emphasis has been on the electronics manufacturing industry in this regard. Domestic production of electronics has increased at a CAGR of 13%, from USD 49 Bn in the Financial Year 2017 to USD 101 Bn in the Financial Year 2023. Notably, the country's electronics export is expected to reach USD 120 Bn by the Financial Year 2026.[7] This highlights the importance of the industry, for the country's economic development.

In pursuit of the government's ambitious target of reaching USD 300 billion by 2025-26[8], the electronics industry in India has received substantial support through various initiatives. Notable among these are the National Policy on Electronics 2019 (NPE), the Public Procurement (Preference to Make in India) Order 2017 (MII order), the establishment of the Electronics Development Fund, the Production Linked Incentive (PLI) scheme for Information Technology (IT) hardware, and the Electronics Manufacturing Clusters scheme (cluster scheme).

The NPE serves as a comprehensive strategy for boosting domestic manufacturing across the entire electronics value chain, positioning India as a global hub. Emphasizing the development of core components, particularly chipsets, the policy aims to reduce dependence on imports and fortify the overall ecosystem.

The synergy with the MII Order prioritizes Indian-made electronics in government acquisitions, fostering local suppliers, and stimulating domestic growth and job opportunities. The Electronics Development Fund, through seed funding and research support, drives innovation and technological advancements in Indian electronics. Attracting global players, the PLI scheme for IT hardware offers incentives for establishing manufacturing units in India, focusing on both domestic and international markets. Additionally, the clusters scheme facilitates a conducive environment by creating dedicated clusters with streamlined operations, plug-and-play facilities, and support services, attracting investments and propelling industry growth.

The Plastic Waste Management Rules (PWMR'16), E-Waste Management Rules (EWMR'22), and Battery Waste Management Rules (BWMR'22) present a unique opportunity for Industry and regulators to collaborate and build a solid foundation to progress on environmental goals and demonstrate India as a leader. While stakeholders have a strong desire to engage in constructive dialogue with MeitY, the MoEFCC, and the CPCB, regarding rule refinement and implementation, the discussions were not very forthcoming. Notably, a collaborative approach fosters continuous improvement, ensuring the rules remain relevant and adaptable to evolving industry needs and environmental best practices.

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5 The Jan Vishwas (Amendment of Provisions) Act, 2023, available at: https://egazette.gov.in/WriteReadData/2023/248047.pdf

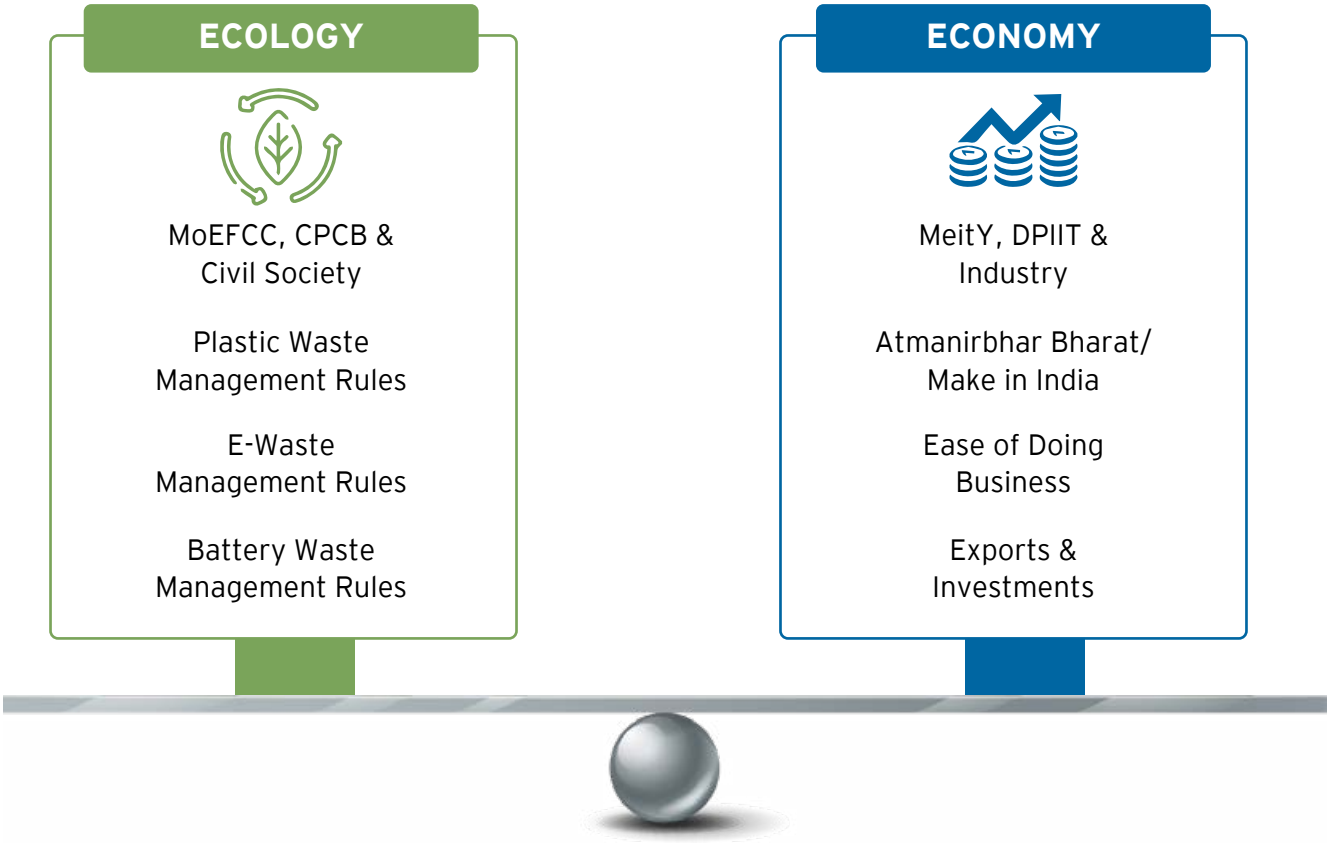
6 The principle of 'Reform, Perform and Transform is powering many gains in Ease of Doing Business: PM, available at: https://www.pmindia.gov.in/en/news_updates/the-principle-of-reform-perform-and-transform-is-powering-many-gains-in-ease-of-doing-business-pm/

7 Invest India, available at: https://www.investindia.gov.in/sector/electronic-systems#:~:text=The%20country's%20electronics%20export%20is,ranks%20from%2067%20in%202021.

8 Design and manufacturing of electronics system, available at: https://pib.gov.in/PressReleaseIframePage.aspx?PRID=1907276#:~:text=India%20is%20emerging%20as%20trusted,electronics%20manufacturing%20by%202025%2D26.

Striking a balance between the goal of sustainable development and spurring electronics manufacturing, is imperative to achieve the goal of sustainable economic development, as given in the adjoining Figure. This is also in sync with Prime Minister Modi's statement on World Environment Day 2023, *"India's ancient culture encompasses both nature and progress. Inspired by this ideology, India today focuses on ecology as much as it emphasizes the economy"*.

Notably, India is the third largest producer of e-waste and generated 3.23 million tons of it in 2019. Managing this waste becomes complex because of ambiguous regulations, poor infrastructure, and the dominant informal sector (believed to be processing ~90% of e-waste), among other challenges.[9] Furthermore, experts have argued that there exists immense potential in augmenting waste recycling in the country, through setting up micro-factories to transform e-waste, recovering high-grade metals (like gold, silver, copper, and palladium) from waste, conversion of plastic waste to value-added products, onboarding the informal sector to the formal sector, etc.[10] Such steps will have a positive impact on employment and economic development and shall also promote a circular economy. An optimal, inclusive, and participative regulatory and policy landscape is required to achieve this, coupled with in-spirit implementation of the rules.



[9] E-Waste Management in India: Challenges and Opportunities, available at: https://www.communicationstoday.co.in/article-on-e-waste-management-in-india-challenges-and-opportunities/

[10] Recycling of e-waste in India and its potential, available at: https://www.downtoearth.org.in/blog/waste/recycling-of-e-waste-in-india-and-its-potential-64034

1.2 Understanding the regulatory landscape and key stakeholders

In the realm of environmental regulations, EoDB assumes a unique significance. Industries, amidst the dynamic landscape of sustainability, are confronted with compliance issues that extend beyond simple operational adjustments. Achieving the seamless integration of environmental responsibility into business operations necessitates a delicate balance—one that aligns regulatory expectations with the practicalities of the industry.

Electronics manufacturing is a case in point, which is marred by the heavy compliance burden of environmental regulations. India's journey towards regulating plastic, e-waste, and battery waste has been an evolving one, with significant milestones marking progress and adaptation to ever-growing challenges. Over the past two years, a slew of new regulations pertaining to the management of such waste has been introduced. Given below is a timeline of the evolution of relevant regulations.

Figure 2: Timeline of evolution of environmental regulations

PLASTIC WASTE MANAGEMENT RULES

- **2011: Plastic Waste (Management and Handling) Rules, 2011**
- **Mar 2016: Initial Plastic Waste Management Rules** introduced, mandating segregation and collection of plastic waste, phasing out carry bags below 40 microns, and establishing Extended Producer Responsibility (EPR).
- **Mar 2018: First Amendment** requires manufacturers and brand owners to register with CPCB for EPR compliance.
- **Aug 2021: Second Amendment** bans single-use plastics (SUPs) like straws, cups, and plates.
- **Sep 2021: Third Amendment** encourages use of recycled plastics in various products.
- **Feb 2022: Fourth Amendment (EPR Guidelines)** outlines specific EPR targets and responsibilities for different industries.
- **Jul 2022:** Fifth Amendment (EPR) strengthens EPR framework by introducing financial penalties and extended producer liability.
- April 2023: PWM Amendment Rules 2023
- Oct 2023: PWM Second Amendment Rules 2023 further expands the scope of regulated plastic items and strengthens EPR obligations.
- March 2024: PWM Amendment Rules 2024 introduce revisions and new provisions concerning definitions, responsibilities, and regulatory frameworks for managing plastic waste, focusing on biodegradable plastics.

BATTERY WASTE MANAGEMENT RULES

- **Mar 2001: Initial Battery (Management and Handling) Rules** established collection and recycling framework for lead-acid batteries.
- **Mar 2016: Amendment** expands scope to include other types of batteries.
- **Aug 2022: Battery Waste Management Rules 2022**
- **Mar 2023: Amendment** extends deadlines and incorporates feedback from stakeholders.
- **October 2023: BWM Amendment Rule 2023**
- **March 2024: Amendment** significantly included changes to Rule 10 on EP`R certificate pricing and Rule 13 on enforcement guidelines.

E-WASTE MANAGEMENT RULES

- **2011: E-waste (Management and Handling) Rules, 2011** which came into effect from 1st May 2012.
- **May 2016: E-Waste (Management) Rules** issued, regulating e-waste collection, processing, and disposal, with EPR obligations for producers.
- **Mar 2018: Amendment** streamlines collection system and broadens producer responsibility.
- **Nov 2022: E-waste (Management) Rules, 2022** will come into force from 1st April, 2023.
- **Jan 2023: Second Amendment** clarifies some provisions and extends deadlines.
- **July 2023: E-waste (Management) Second Amendment Rules, 2023**
- **March 2024: Amendment** significantly revise and add new provisions pertainining to dismantler definition, flexilibilty in filing returns, EPR certificate exchange platform and regulation and pricing of EPR Certificate.

These rules witnessed major amendments and proposed a new regime of Extended Producer Responsibility (EPR) regulations, i.e., placing the financial and physical responsibility for the end-of-life management of a product back on to the producer who created it. In simpler terms, producers are held accountable for the environmental impact of their products throughout their entire lifecycle, not just until they're sold. Coupled with the frequent release of added notifications, memorandums, and Standard Operating Procedures (SOPs), it is safe to say that India's environmental compliance regime has been in a state of dynamic flux lately, causing uncertainty and ambiguity for a gamut of stakeholders.

1.3 About the report

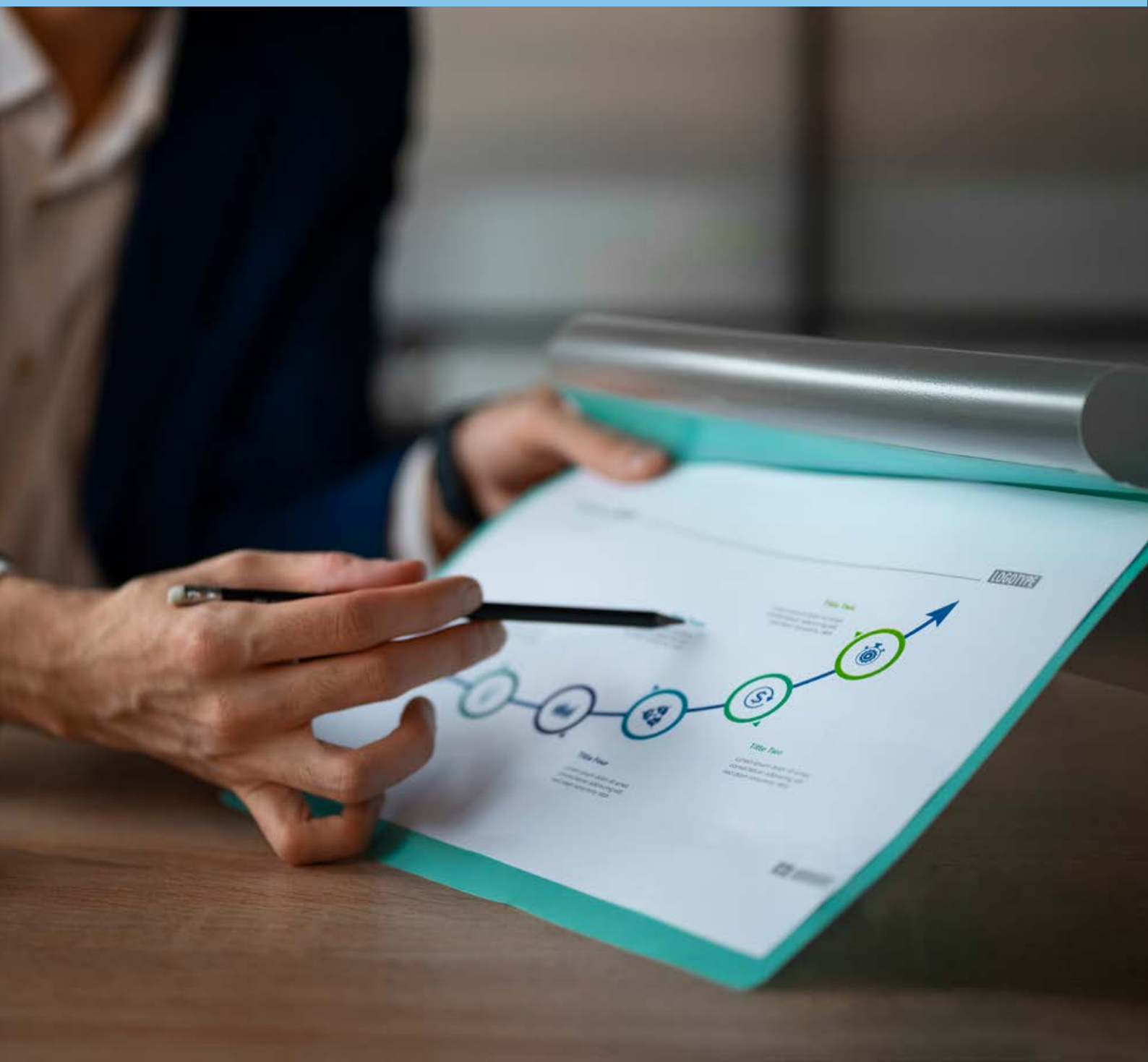
The report seeks to examine the legislative process of rulemaking, as well as its implementation. This has been benchmarked against good sectoral practices in India, which has been captured in Chapter 2.

Chapter 3 conducts an in-depth analysis of the existing regulatory framework for environmental compliances on the electronics manufacturing industry, by deep-diving into the specific challenges posed by PWMR'16, EWMR'22, and BWMR'22. Good international practices have also been identified in the chapter.

The report concludes with Chapter 4, which details the way forward, by giving actionable recommendations, for balancing sustainable development and spurring electronics manufacturing, to achieve the goal of sustainable economic development.

02

Concerns Towards the Rule-Making Process



India has done well to lay down a detailed process of rulemaking. In 2014, the government formulated a pre-legislative consultation policy that ministries were expected to follow before submitting a legislative proposal to the union cabinet for approval. The policy specifies that a draft bill be placed in the public domain for 30 days for comments. The justification for its enactment, financial implications, and estimation of its impact should accompany the draft. The policy also prescribes that the ministry publishes the comments received on the draft on its website.[11]

While it may appear that rule makers followed these principles while enacting the PWMR'16, the EWMR'22, and the BWMR'22; however, stakeholders allege that these were not followed in spirit, and mere checkbox compliance was adopted in this regard. Given below are select concerns raised by them in this regard.

The policy specifies that a draft bill be placed in the public domain for 30 days for comments. The justification for its enactment, financial implications, and estimation of its impact should accompany the draft

2.1 Rule-making process

Concerns have been raised by various stakeholders, particularly industry players, regarding the perceived absence of comprehensive pre-draft consultations and insufficient post-draft discussions during the formulation and modification of rules. There is a notable absence of acknowledgment, analysis, or feedback on industry inputs and concerns, as expressed by different stakeholders. This lacuna is thought to have adversely affected stakeholders, a matter that will be explored further below.

2.1.1 Lack of industry consultation before rolling out SOPs and other notifications

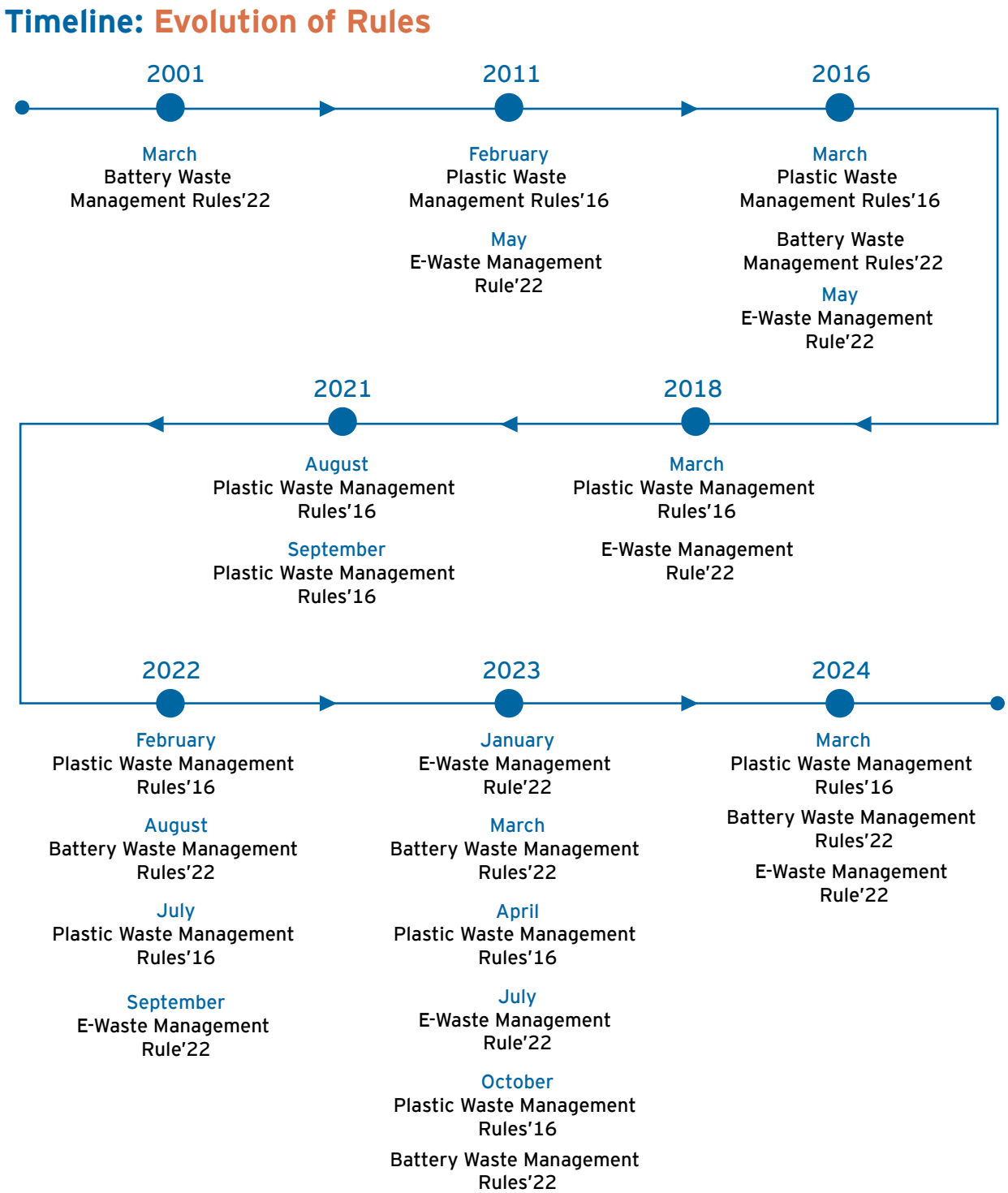
Issue: Acknowledging the existing 60-day feedback window for new notifications and SOPs, stakeholders express a desire for more transparent and ongoing dialogue in the rule-making process. Making submitted comments more visible and providing detailed feedback would enhance stakeholder engagement. Exploring additional channels for consultation, such as Open House Discussions (OHDs) could yield valuable insights and promote a collaborative environment. Collaboratively refining the consultation process ensures a comprehensive representation of voices, contributing effectively to the development of robust and impactful environmental regulations.

Impact: Given that the above is applicable for nearly all rules, notifications, and SOPs, that have been issued in the recent past, stakeholders, especially the industry, have had to face regulatory uncertainty, as well as compliance with sub-optimal rules. This has led to a substantial investment of time and effort in navigating inconsistencies, presenting challenges faced by them to policymakers, and proposing regulatory alternatives based on sectoral and international good practices. Making matters worse is the limited relief received by the industry on such issues.

[11] Pre-Consultation Policy: https://lddashboard.legislative.gov.in/documents/pre-legislative-consultation-policy

The chart below illustrates the contrast between the implementation of EWMR 2016 versus the implementation of PWM 2016, which was enacted without consulting the industry, resulting in a substantial number of subsequent amendments. This highlights the importance of involving industry stakeholders, particularly producers with relevant experience, in the regulatory process to avoid unintended consequences and facilitate a more effective implementation.

Figure 3: Timeline of the evolution of PWMR 2016, BWM 2022 & EWMR 2022



Sectoral good practice: The MoEFCC and CPCB should consider adopting a good consultative process practice like the one adopted by the Telecom Regulatory Authority of India (TRAI), which follows a multi-layered consultation process, as has been depicted in the figure below.

Figure 4: TRAI's stakeholder consultation process

Pre-draft consultation

- Releases a discussion paper listing the need and issues to be addressed through regulation.
- Comments recieved are uploaded on its website, and counter comments are invlited, which are also uploaded for public consumption.
- OHD is also organized in many instances.

Draft consultation

- Draft regulation is prepared based on feedback received.
- Paper on its analysis is also often released.
- Comments and counter comments are invited on it, which are placed on its website.
- OHD is organized on it if required.

Post-draft

- Regulation is finalized and released in public domain.

The MoEFCC and the CPCB may take inspiration from the below-mentioned international good practices.

Figure 5: Examples of international good practices

Jurisdiction	Issue	Good practice
European Union (EU)[12]	Waste management	Consults with different stakeholders through a multi-step process, including green paper publication, public meetings, impact assessment, and public consultations. The comprehensive approach ensures that rules are practical, and achievable, and avoids undue compliance burden on stakeholders. Specific mechanisms like BUSINESS Europe and ongoing engagement reflect the EU's commitment to involving stakeholders, making rules effective, efficient, and proportionate.
	Single-Use Plastics Directive 2018 (received 17,000+ responses) and Packaging and Packaging Waste Directive 2019 (received 10,000+ responses)	These consultations and the numerous responses received in them illustrate the EU's commitment to diverse stakeholder input in plastic waste management. This also demonstrates practical implementation, with substantial responses ensuring diverse perspectives are considered in rule development, aligning with the EU's commitment to successful rule outcomes.
Canada[13]	Plastic waste reduction	Canada adopts a consultative approach involving industry, government, and environmental NGOs in plastic waste reduction. Stakeholders provided feedback on labelling rules and the federal plastics registry. Canada facilitates inputs on implementation, harmonization, and industry inequalities. It also recognizes the importance of third-party standards, ensuring a level playing field in achieving zero plastic waste by 2030.
	Plastic labelling rules and federal registry	There are ongoing consultations on plastic labelling rules and the federal plastics registry in Canada. Stakeholder inputs on recycled content requirements and other regulations are considered. Addressing their concerns ensures industry alignment and feedback on key aspects like recyclability thresholds and EPR is also incorporated.

[12] A European Strategy for Plastics in a Circular Economy, available at: https://www.europarc.org/wp-content/uploads/2018/01/Eu-plastics-strategy-brochure.pdf

[13] Plan for the Ban: New Consultation Launched for Plastics Labelling Framework and Federal Plastics Registry, available at: https://mcmillan.ca/insights/publications/plan-for-the-ban-new-consultation-launched-for-plastics-labelling-framework-and-federal-plastics-registry/

Jurisdiction	Issue	Good practice
Australia[14]	Battery waste management consultation	Australia implemented a thorough consultation process specifically focused on large Li-ion batteries, including those in electric vehicles and stationary energy storage, with a brief overview of smaller batteries in consumer electronics. The consultation process involved various stakeholders, ensuring a diverse range of perspectives, including those from associations, battery distributors, automotive companies, and energy retailers.
	Evidence-based scientific consultation process	The consultation process utilized a structured survey, adapted to the respondent's role in the supply chain, covering aspects such as battery details, sales estimates, lifespan, embedment in products, environmental or safety risks, product labeling, identified gaps in infrastructure, and any regulatory shortcomings related to hazardous waste, dangerous goods, transport, and standards, and arrangements for taking back used batteries. Such a detailed and inclusive approach ensures a comprehensive understanding of challenges and opportunities in managing Li-ion batteries. The survey's coverage of various aspects provides nuanced insights critical for developing effective regulations and practices.

Recommendation: Participating in extensive consultations, both before and after the drafting stage, serves as a valuable mechanism for gaining insights into industry practices. This engagement fosters a collaborative effort, allowing stakeholders to collectively identify solutions that align with the interests of all involved stakeholders. The multi-layered nature of these consultations not only enhances transparency in the rule-making process but also plays a pivotal role in shaping regulations that consider the diverse interests and concerns of stakeholders. The following benefits of pre- and post-draft public consultations should be noted.

The multi-layered nature of these consultations not only enhances transparency in the rule-making process but also plays a pivotal role in shaping regulations that consider the diverse interests and concerns of stakeholders

[14] https://bcycle.com.au/wp-content/uploads/2022/02/AU-Li-ion-battery-consultation-report-2016.pdf

Figure 6: Benefits of Pre and Post Draft Consultation

Pre-draft consultation

Consultations with stakeholders revealed practical challenges and limitations, ensuring regulations are informed by real-world experience.

Collaborative discussions foster creative solutions addressing industry concerns while achieving environmental goals.

Anticipating implementation hurdles through consultations minimizes disruption and eases future rollout, by early identification of roadblocks.

Post-draft consultation

Public access to proposed regulations and stakeholder feedback received on them builds trust and encourages open dialogue about potential impacts.

Addressing concerns early increases acceptance and compliance with the final regulations, through enhanced stakeholder buy-in.

Feedback allows for refinement and adjustments in rules, ensuring regulations are practical and impactful.

For policymakers, such an inclusive approach provides a comprehensive understanding of the industry landscape, facilitating the crafting of regulations that are well-informed and balanced. By offering a platform for open dialogue and information exchange, consultations contribute to the development of effective policies that consider the nuanced perspectives of stakeholders. This collaborative process not only strengthens the regulatory framework but also promotes a more responsive and adaptive approach, ensuring that policies align with industry dynamics and achieve the intended outcomes. Furthermore, open, and continuous dialogue fosters a culture of adaptation and continuous improvement in environmental regulations. The inclusivity of such consultations ultimately benefits policymakers by fostering the creation of regulatory frameworks that are both robust and responsive to the needs of all stakeholders involved.

To further enhance the effectiveness of these consultations, the Ministry should proactively publish clear objectives and requirements at the draft stage, ensuring stakeholders understand the policy's goals. This approach fosters focused discussions, promotes transparency, and enhances stakeholder alignment, ultimately leading to well-informed and balanced regulations.

2.1.2 Lack of cost-benefit analysis

Issue: Regulations can impact diverse stakeholder groups in different ways. Sub-optimal regulations have the potential to increase compliance costs and can have unintended outcomes (including failure to achieve its objectives). This can be further elucidated with the example of the BWMR, as given subsequently.

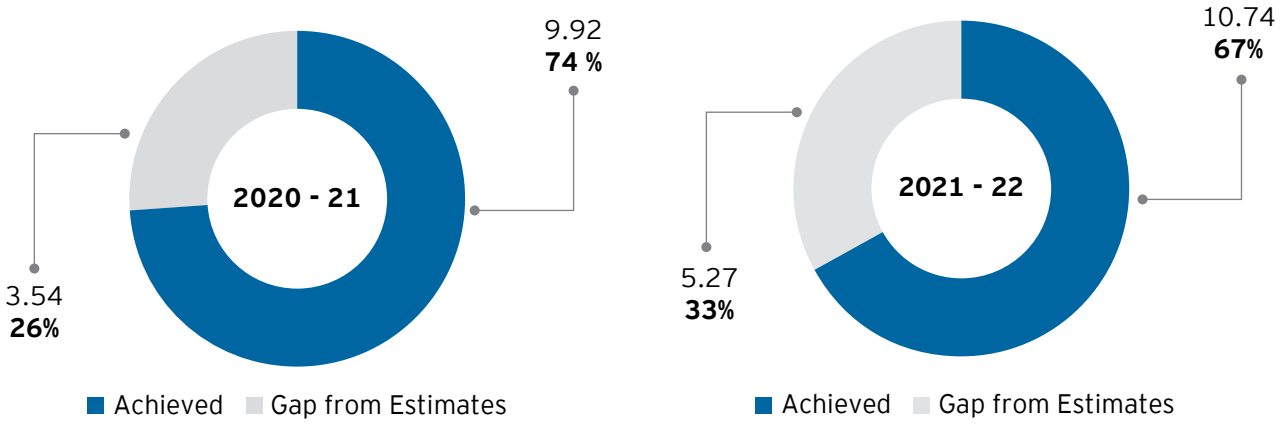
- Accordingly, it is imperative to understand the possible impact of any regulation, proposed or in operation, to achieve intended outcomes. Undertaking a Cost-Benefit Analysis (CBA) helps in this regard.[15] However, this has not been done for the environmental regulations discussed herein.

Notably, the Department for Promotion of Industry and Internal Trade (DPIIT), previously known as the Department of Industrial Policy and Promotion (DIPP) had constituted a Better Regulatory Advisory Group (BRAG) in 2018, to investigate the issues to improve regulatory processes for fast-tracking of investments, both from the domestic and the foreign companies. The members emphasized that there is a need to evaluate the regulatory burden and create a mechanism for conducting a Regulatory Impact Assessment (RIA) of proposed regulations.[16] Its importance has been emphasized below:

- **Systematic analysis:** RIA provides a structured framework for evaluating the potential impacts (positive and negative) of proposed regulations, ensuring informed decision-making.
- **Cost-benefit balance:** RIA quantifies the costs and benefits of different regulatory options, enabling the selection of the most efficient and effective choice.
- **Public participation:** RIA embraces public consultation throughout the process, incorporating diverse perspectives and fostering ownership of regulations.
- **Transparency and accountability:** By making assessments readily available, RIA enhances transparency and accountability in policy development.
- **Continuous improvement:** RIA facilitates ongoing monitoring and evaluation of regulations, allowing for adjustments based on real-world feedback.

Impact: As has been discussed in the subsequent chapter, drafting/ amending regulations without a thorough CBA, can have unintended adverse effects on a multitude of stakeholders. This in turn increases compliance costs, reduces investor confidence, diminishes EoDB, and stokes regulatory uncertainty.

Figure 7: E-Waste Collection and Processing



** Figures are in lakh tonnes.*

[15] Regulatory Impact Assessment, available at: https://cuts-ccier.org/regulatory-impact-assessment/

[16] Better Regulatory Advisory Group Convened, available at: https://pib.gov.in/Pressreleaseshare.aspx?PRID=1519359

In reference to the above graphical representation, the reported e-waste collection and processing figures for the financial years 2020-21 and 2021-22 is (3,54,540.70 and 5,27,131.57 tonnes, respectively)[17] compared to the CPCB's estimate of the e-waste generation at national level based on the countrywide sales data provided by producers and average life of notified electrical and electronic equipment (EEE), as mandated under the E-waste Management Rules, 2016 (13,46,496.31 tonnes in 2020-21 and 16,01,155.36 tonnes in 2021-22)[18], which raises concerns about the effectiveness of e-waste management in India. The EPR target of 60% for the financial year 2023-24 poses a significant challenge due to the persistent shortage of EPR certificates as of February 5, 2024, reflecting systemic issues.

Moreover, the delay in the registration of recyclers has led to the forfeiture of nearly nine months' worth of recycling capacity. The registration of only 152 recyclers with the Central Pollution Control Board (CPCB), in contrast to the previous 450, underscores a conspicuous misalignment between industry objectives and the existing recycling capacity. Persistent IT glitches in the portal continue to obstruct the seamless transfer of certificates, underscoring the repercussions of establishing government targets without thorough research into the ecosystem's capabilities, performance, and transition timelines.

International good practice: A notable example is from the United States of America (US), which undertook a study pertaining to e-waste recycling certification programs.[19] This has been discussed in the box story below.

Figure 8: Study conducted in the United States

The US Environmental Protection Agency (EPA) conducted a comprehensive study evaluating the implementation of third-party certification programs for e-waste recyclers. The study affirms the general effectiveness of accreditation, certification, and implementation processes, leading to improved order, management, and heightened awareness of environmental, health, and safety risks in electronics recycling.

The study aimed for transparency, consistency, and intended results in implementing the Responsible Recycling Standard for Electronics Recyclers (R2) and e-Stewards Standard. Collaborative efforts ensure diverse perspectives and expertise, emphasizing transparency, consistency, and desired outcomes in implementing recycling standards. Incorporating stakeholder interviews and facility audits enhances the evaluation's credibility.

Strategies proposed in the study include additional training, regular standard updates, increased audit time, and addressing perceived conflict-of-interest issues. These proposed strategies address identified areas for improvement, ensuring ongoing enhancements. Recommendations contribute to the continued effectiveness and relevance of certification programs, fostering better environmental practices in electronic waste recycling.

[17] Rajya Sabha 2024, unstarred question no. 670, available at: https://sansad.in/rs/questions/questions-and-answers

[18] Generation of E-waste, available at: https://pib.gov.in/PressReleasePage.aspx?PRID=1943201

[19] Implementation Study of the Electronics Recycling Standards, available at: https://www.epa.gov/sites/default/files/2016-02/documents/u_s_epa_fact_sheet_implementation_study_1.pdf

Recommendation: RIA is a systematic process aimed at identifying and evaluating the direct and indirect impact of regulations through consistent analytical methods. This method involves a participatory approach, incorporating public consultation to comprehensively assess these impacts. The process further entails the determination of associated costs and benefits, enabling the selection of the most appropriate regulatory alternative. To enhance the robustness of regulatory decision-making, it is advisable for the MoEFCC and the CPCB to institutionalize the practice of conducting an RIA/feasibility study before enacting or amending any regulation. This institutionalization ensures a thorough understanding of the potential implications of regulations and allows for informed decision-making that aligns with the interests of all stakeholders involved. Its importance for strengthening environmental regulations is visible through the points given below.

Regulatory Impact Assessment (RIA) is a systematic process aimed at identifying and evaluating the direct and indirect impact of regulations through consistent analytical methods. This method involves a participatory approach, incorporating public consultation to comprehensively assess these impacts

- **Mandatory RIA requirement:** Establish a clear policy mandating RIA for all new and amended environmental regulations.
- **Standardized methodology:** Develop consistent guidelines and tools for conducting RIAs to ensure consistent data analysis and interpretation.
- **Early-stage integration:** Integrate RIA into the initial stages of policy development to prevent potential negative impacts from being embedded in final regulations.
- **Public consultation framework:** Define clear methods for public participation in RIAs, including easily accessible information, feedback mechanisms, and transparent reporting of comments.
- **Capacity building:** Train relevant stakeholders (government officials, industry representatives, NGOs) on RIA principles and tools to facilitate effective participation.
- **Efficient and effective regulations:** Regulations designed with comprehensive impact assessments are more likely to achieve their intended goals while minimizing unintended consequences.
- **Enhanced stakeholder trust:** Open and transparent RIAs can build trust and collaboration between policymakers, industry, and the public.
- **Sustainable policy development:** RIAs contribute to long-term sustainable development by prioritizing environmentally sound and economically viable regulations.

2.2 Implementation challenges

Implementation and enforcement of rules with immediate effect without an adequate transition period for making changes to businesses' operational processes can pose challenges for businesses. Also, insufficient guidance on the interpretation, compliance, and knee-jerk consequences in case of non-compliance with the rules showcase the sub-optimal implementation of the rules.

2.2.1 Inadequate transition time to implement regulations and operational process changes

Issue: There is a noticeable pattern wherein the MoEFCC and the CPCB frequently introduce new regulations that require alterations to existing business operational processes, and these regulations typically come into effect immediately. This tendency is exemplified by the implementation of multiple amendments to the PWMR'16 and their associated SOPs, where no grace period is provided for businesses to adapt to the changes. This practice raises considerations about the practical feasibility and preparedness of businesses to swiftly comply with the revised regulatory requirements. Furthermore, identifying responsible parties and securing funds for additional compliance costs is challenging. Existing resources cannot handle new regulations implemented abruptly without a transition period.

Impact: The industry often faces the challenge of insufficient time for a thorough review of new regulations/ amendments, notifications, and SOPs. This has resulted in a dynamic regulatory environment, requiring businesses to constantly modify their business operations through a knee-jerk response, and remaining unprepared for complying with the regulatory change. Despite efforts, and the paucity of time, coupled with ambiguous and extensive disclosure requirements, the industry often faces risks of non-compliance or timely compliance, thus reducing their EoDB. The box story below discusses an example in this regard.

Figure 9: Box story on unprepared rule implementation

Lack of availability of duly registered recyclers on the CPCB portal

A limited number of recyclers are currently registered and capable of generating EPR credits for producers. This shortage is preventing the electronics Industry from fulfilling its obligations outlined in the EPR plans. The validation and approval process for recyclers on the CPCB portal is still pending. The industry is currently facing tight timelines to meet its EPR obligations without access to authorized recyclers. This has led to:

- Uncertainty in forecasting and planning the procurement process.
- Administrative burden on the industry to formalize contracts with recyclers within short notice thus impeding timely compliance.

While there is a definitive need for the CPCB to accelerate the onboarding and validation process of recyclers, the issue also highlights the perils faced by the industry due to tight or no transition periods, leading to unprepared and sub-optimal implementation of the rules.

A similar issue can also be seen in the implementation of the BWMR'22. Details have been covered in the box story below.

Figure 10: Box story on immediate enforcement of rules

Immediate enforcement of the rules

The announcement of the BWMR'23 took many by surprise. While the need for responsible battery waste management has been acknowledged for some time, the abruptness of the announcement raised eyebrows and sparked questions. Notably, the BWMR'22 was also implemented abruptly in August 2022, without prior consultation with the industry.

Unfortunately, essential instructions for recyclers, SOPs, and guidance for producers were not provided alongside the rules. Additionally, despite continuous industry requests and the assertion that the EWMR'16 encompassed BWMR'22, there was no proper mapping of battery recycling capabilities.

The lack of timely and consistent guidance that aligns with industry needs and the intent of the rules could result in varying interpretations during implementation. This variation poses a significant risk of non-compliance for different stakeholders, as the ultimate responsibility rests with producers to demonstrate EPR compliance through the purchase of EPR credits.

While there is merit in delaying the implementation of BWMR'22 this should be coupled with CPCB's commitment to ensure that their portal is fully operational, authorized recyclers are registered, and EPR certificates are accessible on the portal. Releasing clear instructions to all relevant entities assuring that the old system would remain in place until the new system is sufficiently developed and tested would also be useful, to streamline the industry's transition and compliance.

Sectoral good practices: Rule makers of environmental regulations may take inspiration from the IT and telecom sectors, which provide the industry a transition period or room, to comply with new/ amended regulations. Two examples have been tabulated in the figure below.

Figure 11: Box Story on Transition Period

Department/ Ministry/ Regulator	Regulation	Transition period
MeitY	The Digital Personal Data Protection Act, 2023 (DPDPA)	The DPDPA was passed into law on August 11, 2023, and is scheduled to commence on January 1, 2024,[20] and is also likely to be implemented in a graded manner for different stakeholders.[21]
The Department of Telecommunications (DoT)	Indian Telecommunication Bill, 2022 (telecom bill)	The telecom bill allows the government to appoint different dates for enforcing different provisions of the bill.[22]

Recommendation: To enhance the effectiveness of regulatory changes, it is recommended that the MoEFCC and the CPCB institute a thoughtful and collaborative transition period for the implementation of new environmental regulations. Incorporating a voluntary phase lasting at least 2 to 3 years before enforcement can provide stakeholders with a period of adjustment. This duration should be determined through consultation with stakeholders, aiming to facilitate a seamless adaptation to the regulatory changes. Several critical considerations need to be addressed during this period.

Firstly, the impact on the Global Supply Chains (GSC) of the electronics industry should be carefully assessed to anticipate potential disruptions. This evaluation should consider the necessary timeline for adjustments within international collaborations and partnerships. Secondly, acknowledging the on-ground industry practices is imperative, involving an understanding of the existing infrastructure, technology, and operational realities of the sector. Sufficient time should be allowed for upgrading facilities, adopting new practices, and providing training for personnel for compliance with the regulations.

Additionally, a thorough evaluation of the industry's readiness to implement the new regulations is essential, considering the financial and logistical resources required for compliance. Adequate time should be provided for businesses to make necessary adjustments and investments. A phased implementation approach should also be considered, allowing for gradual adaptation, and minimizing disruption. This may involve an initial focus on specific aspects or sectors before expanding to full coverage over time.

Furthermore, the transition period should include measures for capacity building and support, such as training programs, technical assistance, and financial incentives to facilitate compliance and encourage the adoption of innovative and sustainable practices. Regular review and monitoring mechanisms should be established to assess the effectiveness of the transition period, with adjustments made as needed based on feedback from stakeholders and industry progress.

The benefits of incorporating a flexible transition period are manifold. It is anticipated that such an approach will lead to increased compliance rates, as a reasonable timeframe enables businesses to adapt and invest in necessary changes. A phased implementation also contributes to minimizing economic disruption to industry and its activities. Moreover, enhanced stakeholder collaboration is expected through consultation and collaboration during the transition period, fostering trust, understanding, and ownership of the regulations. The flexibility in the timeframe encourages innovation and adaptation within the industry while ensuring long-term environmental benefits through the sustained effectiveness of environmental regulations.

2.2.2 Lack of demos and trainings

Issue: The current practices of the CPCB do not involve conducting demonstrations or offering training through its online portals for the implementation of environmental rules. This observation

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[20] A Deep Dive Into India's DPDPA 2023 And Its Impact On Business, available at: https://inc42.com/resources/a-deep-dive-into-indias-dpdpa-2023-and-its-impact-on-business/?login=1

[21] India's Data Protection Law Will Have Different Timelines For Compliance For Different Types Of Entities, available at: https://www.medianama.com/2023/08/223-data-protection-law-graded-timelines/

[22] Draft Indian Telecommunication Bill, 2022, available at: https://dot.gov.in/sites/default/files/Draft%20Indian%20Telecommunication%20Bill%2C%202022.pdf

highlights an area where there is room for potential enhancement in the CPCB's approach to user engagement and education. By incorporating subtle initiatives such as demonstrations or training modules, the CPCB could subtly contribute to fostering a more informed and proficient user base, promoting effective implementation of environmental regulations. This approach aligns with the idea of providing supportive resources to stakeholders, offering an opportunity for continuous improvement in CPCB's outreach strategies.

Impact: Stakeholders are left unaware/ unclear regarding alterations required to existing functionalities or the introduction of new modules. A good example has been captured in the box story below.

Figure 12: Issues in the E-waste portal

Inconsistent guidance on the registration and amendment process on the e-waste portal

The e-waste Portal was activated in April 2023, with limited functionality. The SOPs rolling out the amendment process were issued in April too, but related functionality in the portal like Information Technology and Communication (ITEW categorization), and End-Of-Life of product categories were not finalized until June. Despite the same, a deadline of June 30th to complete the registration and amendment process was imposed, including instructions to customs. Further, CPCB did not offer clear guidance that failure to file an amendment by June 30th (which is a time-consuming process – gathering data, seeking approvals, and notarizing documentation) would result in shipment blockage.

This caused severe stress to the industry. Insufficient instructions and unreasonable timelines exacerbated the undue burden and stress experienced by the industry.

This underscores the importance of offering clear and timely guidance while introducing new processes, to ensure smooth implementation and minimize disruptions. Disseminating FAQs would have been useful in this regard.

Similarly, concerns pertaining to lack of issuance of SOPs and guidance for stakeholders, have been highlighted in another box story below.

Figure 13: Guidance for recyclers

Issuing SOPs and guidance for recyclers

Appropriate instructions need to be issued to recyclers for proper management, recycling, and reporting of e-waste, that meet industry standards and instill confidence while purchasing EPR credits.

The absence of timely and uniform guidance that is aligned with industry requirements, and in the spirit of the rules, causes variance in implementation, and puts the industry at risk of non-compliance, as the ultimate responsibility lies with the Producer to demonstrate EPR compliance through the purchase of EPR credits.

Accordingly, it is recommended that the CPCB accelerate the release of SOPs and guidelines to recyclers, for effective EPR compliance.

Recommendation: As the CPCB portal plays a crucial role in enforcing waste management regulations, it is essential to ensure that all relevant stakeholders receive adequate training and demonstrations on compliance, which could be undertaken through awareness workshops, OHDs, releasing Frequently Asked Questions (FAQs), and other means of stakeholder engagement. This will help in a smooth transition and effective implementation of the regulations.

These issues underscore the pressing need for a more coherent and streamlined approach in implementing environment protection regulations, one that strikes a balance between environmental protection and ease of compliance for the electronics manufacturing sector. Given the above, the subsequent chapters deep dive into specific lacunae present in the rules. The PM's statement *'faster the environment clearance is available, the faster the development will also take place'*,[23] is kept at the center of the analysis.

These issues underscore the pressing need for a more coherent and streamlined approach in implementing environment protection regulations, one that strikes a balance between environmental protection and ease of compliance for the electronics manufacturing sector

[23] PM inaugurates the National Conference of Environment Ministers of all States, available at: https://pib.gov.in/PressReleasePage.aspx?PRID=1861687

03

Specific Industry Concerns in the Rules

It cannot be denied that the three environment protection rules are well-intentioned and aim to bolster environmental sustainability. However, they contain several lacunae which inadvertently introduce a myriad of onerous compliance obligations upon the industry. Also, the lack of concerted efforts and harmonization between different arms of the government (evident from disparities and conflicting approaches taken by them), and unclear communication has led to an avoidable increase in the compliance burden for the electronics industry. This is posing challenges for businesses in terms of interpretation, adaptation, and adherence to these evolving rules. India's electronics manufacturing industry has voiced the following concerns in different regulations.

Internationally, the landscape of waste management is shaped by a mosaic of legislative frameworks, each designed to address specific environmental challenges

International good practices: Internationally, the landscape of waste management is shaped by a mosaic of legislative frameworks, each designed to address specific environmental challenges. In the European Union (EU), the Waste Framework Directive (2008/98/EC)[24] lays the groundwork for comprehensive waste handling, emphasizing prevention, reuse, recycling, and proper disposal. The Single-Use Plastics Directive[25] complements these efforts by targeting specific plastic products, and setting ambitious goals for plastic collection and recycled content to combat the environmental impact of plastic pollution.

Canada is at the forefront with the Single-use Plastics Prohibition Regulations[26], a proactive measure prohibiting the manufacture, import, sale, and export of certain single-use plastic items. This regulatory shift encourages the adoption of alternative products, fostering a circular economy and contributing to global initiatives for reducing plastic waste. Meanwhile, Australia's Recycling and Waste Reduction Act[27], 2020, addresses the export of various waste materials, employing compliance activities like audits and monitoring to ensure responsible waste management practices.

In Asia, South Korea, under the Waste Control Act[28], regulates waste, including batteries, enforcing proper management, and recycling to minimize environmental impact. Singapore, through the Resource Sustainability Act 2019[29], incorporates regulations related to offenses, exemptions, and prescribed regulated products, showcasing a commitment to responsible waste management practices. These diverse legislative approaches reflect a global commitment to addressing the multifaceted challenges of waste management and environmental sustainability.

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[24] Waste Framework Directive: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex%3A32008L0098

[25] Single Use Plastics Directive: https://eur-lex.europa.eu/eli/dir/2019/904/oj

[26] Single Use Plastics Prohibition Regulations: https://www.canada.ca/en/environment-climate-change/services/managing-reducing-waste/reduce-plastic-waste/single-use-plastic-overview.html

[27] Recycling and Waste Reduction Act 2020: https://faolex.fao.org/docs/pdf/aus213263.pdf

[28] Wastes Control Act: https://elaw.klri.re.kr/eng_mobile/viewer.do?hseq=43284&type=part&key=39#:~:text=To%20the%20extent%20possible%2C%20wastes,of%20wastes%20shall%20be%20restrained.&text=Wastes%20shall%20be%20recycled%20rather,the%20improvement%20of%20resource%20productivity.

[29] Resource Sustainability Act, 2019: https://www.fao.org/faolex/results/details/en/c/LEX-FAOC211084/#:~:text=This%20Act%20is%20enacted%20to,and%20to%20promote%20resource%20sustainability.

3.1 Plastic waste management

Figure 14: Plastic Waste Management Rules

Evolution of Plastic Waste Management in India

In a transformative shift towards sustainable plastic waste management, the Plastic Waste Management Rules underwent two crucial amendments in 2023 and a further amendment was published in March 2024, ushering in significant changes to India's approach to plastic usage and disposal.

The July 7 amendment introduced a separate category for biodegradable plastics, exempting them from the single-use plastic ban under specific conditions. It also strengthened Extended Producer Responsibility (EPR) and introduced reporting for units using plastic. The October 16 amendment expanded EPR obligations, introduced an online trading platform for certificates, mandated labelling for compostable plastics, and prohibited the use of plastic raw materials in banned single-use plastic items, while also addressing pre-consumer plastic waste from biodegradable items.

Further, the 2024 amendment, refines definitions related to plastics, extending the scope of regulatory oversight to include a broader range of stakeholders such as importers and manufacturers of all types of plastic materials, including biodegradable and compostable plastics. A notable change is the shift in the biodegradable plastics definition, focusing on specific environmental conditions for degradation without explicitly requiring CPCB certification.

Additionally, the amendments streamline registration and reporting processes, enforcing stricter compliance through a centralized online portal. They also enhance the responsibilities of local bodies and Panchayats in developing waste management infrastructure and in annual reporting, aiming to create a more accountable and structured framework for managing plastic waste effectively across the nation.

The PWMR'16 places the onus on plastic producers and brand owners to manage the waste generated by their products through EPR. They emphasize waste segregation at the source, encourage the development of infrastructure for plastic waste management by local authorities, and ban the use of certain types of plastic bags and sheets. Additionally, entities involved in plastic waste recycling and disposal are required to obtain necessary registrations and recognition, and non-compliance could result in penalties. The rules strive to promote responsible plastic waste handling and reduce environmental impacts. The challenges posed by these rules have been discussed below.

3.1.1 Uploading sales/ procurement invoices on the CPCB's EPR portal

Issue: The CPCB in a circular dated 21st February 2023,[30] required all Producers, Importers, and Brand Owners (PIBOs) to upload transaction invoices related to plastic packaging on the online EPR portal within fifteen (15) days of issuance. It further warned of strict consequences in case of non-compliance. Notably, despite the MoEFCC issuing an office memorandum, the invoice requirement is not withdrawn officially.

[30] Provision of transaction details related to plastic packaging by producers, importers and brand owners on centralized EPR portal for plastic packaging, available at: https://cpcb.nic.in/uploads/plasticwaste/Notice_21022023.pdf

Figure 15: Impact of the Plastic Invoices Issue on the Electronics Manufacturing Industry

Adverse impact of mandating uploading invoices on the CPCB's EPR portal

Mandate not meeting objective: It is to be noted that product sales invoices do not cover plastic procurement details. Hence these cannot be used to demonstrate EPR compliance. Also, many importers and brand owners within the electronics sector are involved in the procurement and sale of finished goods only. The portal doesn't distinguish between importers of plastic packaging and importers of finished goods thus putting an onerous burden of compliance on Brand Owners and Importers who do not procure plastic packaging but only finished goods. Furthermore, questions have been raised on the utility of the mandate, in helping the CPCB to verify plastic procurement details and/ or auto-generating EPR targets.

Adverse impact: Regardless of the points mentioned earlier, it is observed that the current CPCB mandate seems to pose challenges for the electronics manufacturing industry. This is mainly due to the inclusion of business-sensitive information in invoices, leading to concerns about possible misuse. The absence of well-defined redressal mechanisms further adds to the industry's apprehension. Consequently, industry stakeholder's express reservations about sharing such sensitive data, mindful of unintentional non-compliance.

Recommendation: Given the complexities presented by the recent CPCB circular mandating the upload of plastic packaging transaction invoices, it is recommended that the MoEFCC considers the feasibility of receiving submissions via the online EPR portal through a 'self-declaration' mechanism. Providing formal clarification on this matter, consistent with the office memorandum, would play a vital role in enhancing clarity and encouraging adherence to established procedures. Such an approach holds the potential to mitigate concerns surrounding business-sensitive data and ease apprehensions within the electronics manufacturing industry, ultimately fostering improved compliance and cooperation.

3.1.2 Renewal of EPR Registration

Issue: As per the amendment of the PWMR'23, the provision of 'Renewal of Registration' has been removed. However, Rule 13, sub-Rule 9(b), still states, *'The registration granted under this rule shall be valid for a period of one year, unless revoked, suspended, or cancelled and shall subsequently be granted for 3 years'*.

Impact: While the decision to deactivate the renewal tab on the portal is a positive step, there is concern about potential discrepancies in interpretation by the customs and port authorities due to inconsistent language.

Recommendation: It is crucial to ensure uniform and clear communication to prevent varying enforcement practices. Accordingly, the following change can be made in the said rule, "The registration granted under this rule shall have perpetual validity unless revoked, suspended or cancelled".

3.1.3 Marking and labeling concerns

Issue: Under PWMR of 2022 dated July 6, 2022, marking and labeling requirements were exempted for imported products. However, in the amendment published on October 6, 2023, the marking and labelling exemption has been inadvertently missed.

Impact: The lack of clarity regarding the exemption already provided for marking and labeling requirements on imported products, as discussed earlier, contributes to challenges in Ease of Doing Business (EoDB). It is crucial to highlight that global brands operate with standardized manufacturing facilities, encompassing product assembly to final packaging. These shared facilities utilize identical plastic packaging for all countries, India included. Introducing unique changes in packaging specific to India becomes an impractical task and necessitates alignment with global packaging norms to maintain uniformity across markets. This issue underscores the need for clear and harmonized regulations to facilitate smoother business operations, particularly for global brands with common manufacturing processes.

Recommendation: The ICT Industry requests the exemption from the Marking and Labelling requirements for imported products to be reinstated.

3.2 Battery Waste Management

Figure 16: Battery Waste Management Rules

Evolution of Battery Waste Management in India: 2001 to 2024

The Battery Waste Management Rules have evolved significantly over the past few years, the prominent one being the 2022 amendment that introduced several key changes. It extends applicability to all battery types and mandates Extended Producer Responsibility (EPR), requiring producers to meet collection and recycling/refurbishment targets varying by battery type and compliance period. A certification mechanism through EPR certificates issued by registered recyclers/refurbishers has been established. Producers, recyclers and refurbishers must register on a centralized online portal. Provisions for environmental compensation by CPCB/SPCBs for non-compliance and a Committee for Implementation under CPCB have been introduced.

Labeling requirements, including crossed-out wheeled bin symbol and chemical symbols, and prohibitions on certain mercury/cadmium limits, have been specified. Significantly, the rules mandate minimum use of domestically recycled materials in new batteries, increasing over the years - up to 20% for portable batteries, 40% for automotive/industrial batteries, and 20% for EV batteries by 2030-31 and onwards.

Further the 2024 amendment introduces a mechanism for CPCB to fix highest and lowest prices for EPR certificates linked to environmental compensation. The process for preparing environmental compensation guidelines has been revised. Provisions for carrying forward remaining battery quantities to the next compliance cycle under EPR targets have been modified.

For India to establish itself as a significant participant in the battery waste material, it is crucial to develop a comprehensive roadmap. This roadmap should encompass robust Battery Waste Management Rules that align with global best practices. These practices should

cover efficient collection, proper segregation, testing for potential second-use applications, systematic disassembly, and effective recycling processes. However, the targets set by the MoEFCC without a well-developed supporting infrastructure pose significant challenges for producers to adhere to the regulatory requirements. The lack of a concrete framework makes it unrealistic for producers to comply with the mandated targets, hindering India's progress in this crucial sector. Hence, MoEFCC should focus on implementing regulations following a gradual approach basis consultation with the industry.

3.2.1 Harmonization of EPR targets with global targets

Issue: The rules mandated a minimum of 50% recycling of the batteries in FY 2022-23, and over the period of 10 years – 100% collection is expected. On the contrary, even at the end of Q3 of 2023, the recyclers are not registered, and there is no estimate of battery recycling capacity in the country. Even evolved and mature markets like the EU have adopted a staggered approach to set out targets for battery recycling. The European Parliament and Council's Regulation (EU) 2023/1542, dated 12 July 2023, pertaining to batteries and waste batteries, introduces key amendments to Directive 2008/98/EC and Regulation (EU) 2019/1020 while repealing Directive 2006/66/EC. A significant mandate from this regulation stipulates that a minimum of 50% of a battery's weight must undergo recycling. Furthermore, there is a scheduled increase to 65% for lithium-ion batteries starting in 2025 and a subsequent rise to 70% from the year 2030.[31]

Impact: The unrealistic EPR targets are difficult for the industry to comply with and put the industry at risk of non-compliance as the ultimate responsibility lies with the Producer to demonstrate EPR compliance through the purchase of EPR credits.

Recommendation: it is recommended that in line with international good practices, the minimum collection targets are implemented in a staggered manner. Guidance may be taken from the EU in this regard:

- @ 25% from FY 26-27 to FY 29-30
- @ 45% from FY 30-31 to FY 33-34

These targets may further be reviewed in FY 2033-34. Also, until the systems and ecosystem are fully functional, the MoEFCC should not commence enforcement, or allege non-compliance of the rules.

3.2.2 Mandate of use of domestic recycled content in batteries by 2027

Issue: Rule 4(14) mandates that producers shall have the obligation with respect to the minimum use of domestically recycled materials in new batteries by 2027. Industry players claim that there is a lack of technological capability with the existing recyclers in India to undertake such activities within the given time. Also, the rules remain unclear on the mechanism of validating the quantity of recycled content.

[31] The European Parliament and Council's Regulation: https://eur-lex.europa.eu/eli/reg/2023/1542/oj

Impact: The requirement to use only domestically recycled material in batteries raises concerns within Global Value Chains (GVCs), especially those committed to circularity and already planning to incorporate recycled materials. This could potentially hinder India's aspirations of becoming a global Information and Communication Technology (ICT) manufacturing hub.

Recommendation: Given the above, it is recommended that the MoEFCC assesses the Circular Economy infrastructure and availability of quality recycled content in line with the growth aspirations of the ICT industry before mandating the use of domestic recycled content. Furthermore, while it is acknowledged that ICT equipment meant for exports is beyond the ambit of the rules, this should be explicitly mentioned and clarified in the rules. Also, imported batteries may be exempted from such requirements.

Sales invoices of finished products do not carry battery weight data hence submission of daily sales data places an unnecessary compliance burden without contributing to the information that is needed for the calculation of EPR obligations under BMWR'22

3.2.3 Daily upload of sales and procurement data on the CPCB's EPR portal

Issue: Like the issue cited previously in the PWMR'16, the BMWR'22 requires daily upload of sales and procurement data on the CPCB's EPR portal.

Impact: Sales invoices of finished products do not carry battery weight data hence submission of daily sales data places an unnecessary compliance burden without contributing to the information that is needed for the calculation of EPR obligations under BMWR'22. The mandate is not helping CPCB to verify battery procurement details and/ or auto-generating EPR targets. Most brands within the electronics sector are involved in the procurement and sale of finished goods only. The invoices carry business sensitive data which can potentially be misused. The Companies Act allows 6 months for the industry to finalize books of accounts thus uploading any dynamic sales data is in contravention of the Companies Act besides not serving any material benefit on EPR compliance. Safe to say, such onerous demands from CPCB are imposing business risks and pushing the industry into non-compliance.

Recommendation: In the true spirit of EoDB, a self-declaration methodology to declare details of batteries brought into the market on an annual basis should be permitted. While the CPCB has provided verbal assurance of addressing the issue, however, there remains no official clarification on the subject.

3.2.4. Labelling requirement on batteries

Issue: The Labelling requirement on batteries, as outlined in Clause 10(b)(ia) of the Battery Waste Management (Amendment) Rules 2023, mandates producers to ensure that all batteries or battery packs produced are appropriately marked with EPR registration numbers by March 31, 2025.

Impact: The industry has identified practical challenges related to marking the Producers' Individual Brand Owners (PIBO) name and registration number on batteries on the following grounds:

- Firstly, implementing this unique requirement in India could negatively impact the global supply chain, introducing disruption as no other country currently enforces such marking regulations. This may run counter to India's efforts to enhance the Ease of Doing Business (EODB) in the country.
- Additionally, the ICT Industry argues that marking PIBO details on batteries will not yield tangible environmental or recycling benefits. Many ICT products integrate batteries into the host device in a way that renders markings invisible to consumers, limiting the effectiveness of such labelling.
- Furthermore, the industry highlights the compliance burden, emphasizing the impracticality of requiring brand owners to instruct third-party battery manufacturers, often located outside India, to print EPR registration details.
- Lastly, space limitations on batteries pose an additional constraint, making comprehensive labelling challenging.

Recommendation: Given these challenges, the ICT Industry seeks exemption from the labelling mandate to ensure the continued efficiency and competitiveness of its operations.

3.3 E-Waste Management

Figure 17: E-Waste Management Rules

The evolution of compliance overtime

The Indian government's approach to regulating the e-waste recycling sector has undergone significant evolution. Initially, the E-Waste (Management) Rules, 2016, laid the foundation by mandating compulsory authorization from state pollution control bodies for dismantling and recycling units. These rules applied to various stakeholders, including manufacturers, producers, consumers, dealers, refurbishers, dismantlers, and recyclers. Under the Extended Producer Responsibility (EPR) regime, producers were required to obtain EPR Authorization from the Central Pollution Control Board (CPCB) and provide details of their dismantlers and recyclers. The rules also defined 21 categories of notified Electrical and Electronic Equipment (EEE) and set annual e-waste collection targets for producers based on previous sales or generation.

Building upon this framework, the government has introduced the E-Waste (Management) Rules, 2022, which replaced the 2016 rules and came into effect from April 1, 2023. These new rules mark a significant overhaul of the EPR regime for e-waste recycling. A key change is the requirement for manufacturers, producers, refurbishers, dismantlers, and recyclers to register on the CPCB's online portal. Additionally, the new rules have expanded the scope by including 106 EEE categories under the EPR regime, compared to the previous 21 categories.

Furthermore, the 2022 rules have introduced new provisions aimed at strengthening compliance and accountability. These include the generation and transaction of EPR certificates, provisions for environmental compensation and verification audits, and the

establishment of a Steering Committee to oversee implementation. The annual e-waste recycling targets for producers have also been revised, with stable targets set for two-year periods, starting at 60% for 2023-2024 and 2024-25, increasing to 70% for 2025-2026 and 2026-27, and reaching 80% for 2027-28 and onwards.

In the 2023 rules, provisions have been made to determine conversion factors for EPR certificates when there are multiple recycling end-products, based on guidelines issued by the Central Pollution Control Board (CPCB). The rules also extend the exemption period for complying with hazardous substance restrictions until April 1, 2025 for certain categories of electrical and electronic equipment, and until April 1, 2028 for associated parts and spares, provided compliant alternatives are not available. Furthermore, the rules modify Schedule II by omitting the entry for lead in certain medical devices and are expected to introduce new Schedules IIB and IIC listing the categories of equipment exempted from hazardous substance restrictions.

Further the 2024 amendment significantly revised and added new provisions pertaining to dismantler definition, flexibility in filing returns, EPR certificate exchange platform and regulation and pricing of EPR Certificate.

Entities are mandated to collect, recycle, and appropriately dispose of e-waste, with the rules encompassing aspects like storage, transportation, accident reporting, and environmental compensation. Moreover, guidelines focus on minimizing hazardous substances in electrical and electronic equipment manufacturing. The Steering Committee, led by the CPCB Chairman, supervises the execution of environmental rules. Comprising representatives from crucial ministries and industry associations, the committee ensures effective monitoring, dispute resolution, and updates to guidelines, playing a pivotal role in enforcing environmental regulations.[32]

3.3.1 Compatible components and parts

Issue: As per Rule 16(10) of the EWMR'22, manufacturers are required to ensure that components or parts made by different manufacturers are compatible with each other. Manufacturers have distinct supply chains, product designs, and distinct components/ sub-components for each product/ model of products which are internal and classified to organizations.

Impact: The clauses can be read as generic policy statements and are not directly linked to EPR compliance and run the risk of being differently interpreted by enforcement bodies causing disruption to businesses. They also have the potential to adversely impact innovation, thereby threatening the competitive advantages of manufacturers.

Recommendation: The MoEFCC should ensure that generic policy statements be excluded from the ambit of the Rules as they can be interpreted by implementing bodies to mean differently. Regulations without clear specifics for implementation can lead to ambiguous enforcement.

3.3.2 Exorbitant registration fee

Issue: The registration fee criteria were suddenly changed with no prior initiation or consultation. Entities learned about the development, only after reaching the last tab in registration 'payment'

[32] E-waste Management Rules: https://cpcb.nic.in/uploads/Projects/E-Waste/e-waste_rules_2022.pdf

on the portal. A new system of slabs has been introduced taking up the fee from nil or INR 5,000 in previous years, up to INR 10-15 Lakhs while registering under EWMR'22.

Impact: The absence of clear communication and rationale caught the industry by surprise, thereby causing delays in registration due to internal approval routes that need to be adhered to for payment of such high fees.

Recommendation: Accordingly, the CPCB is recommended to reconsider the increased fee, and provide a clear rationale for such a steep hike. Furthermore, any modifications to the fee structure should be made on an annual basis, and the changes should be communicated clearly to the industry. This approach will ensure transparency and allow businesses to plan and adapt accordingly.

04

The way forward

The complex and convoluted compliance landscape created by different regulations has introduced unmethodical compliance obligations upon different stakeholders, including industry players. Effectively addressing the significant challenges discussed above, requires a fundamental restructuring of policy-making methods, especially in the focus areas of EoDB overseen by the MoEFCC, the MeitY, and the CPCB, based on principles of collaboration, transparency, and adaptability.

The complex and convoluted compliance landscape created by different regulations has introduced unmethodical compliance obligations upon different stakeholders, including industry players

4.1 Recommendations

It is advisable to establish a Working Group (WG), which should include government representatives from entities such as the MoEFCC, the MeitY, and the CPCB, alongside industry stakeholders represented by relevant industry bodies and members of civil society. An option to revitalize the Consultative Committee on Environment established by the DPIIT for this specific purpose has been identified. The recommended functions of the WG, categorized as short-term and long-term objectives, are outlined below.

Figure 18: Short-term and long-term recommendations

SHORT-TERM

Regulatory overview

Weighing the merits of the lacunae in the existing rules identified above, as well as scrutinizing the rules for further challenges. Adopting a tailored approach for different stakeholders, instead of adopting a one size fits all approach would be useful.

Undertake awareness generation and capacity building

Conducting awareness generation and capacity building workshops for different stakeholders, on various aspects such as international good practices, interpretation of rules, compliance requirements of regulations etc. Releasing FAQs with respective rules would also be useful.

Optimal implementation

Strive to understand and be sympathetic towards the ground realities of business processes, and the compliance burden placed on them, to recommend a roadmap for the optimal implementation of the rules. This shall help overcome challenges related to insufficient transition periods, and avoid knee jerk regulatory compliance requirements.

Publish regulatory roadmap/annual action plan

Publish regulatory roadmaps and annual action plans which could serve as vital tools for enhancing transparency and fostering stakeholder engagement.

Open up a Two-way communication channel

Create accessible online forums or regular town hall meetings for open dialogue between regulatory authorities and electronics manufacturing stakeholders, fostering collaborative problem-solving and transparency in regulatory processes through diverse perspectives and feedback exchange.

Recycling standards

Establishing robust recycling standards by developing a comprehensive framework in consultation with experts and implementing certification programs for recyclers, to minimize environmental impact, promote material recovery, and drive innovation in recycling processes.

Recovery targets

Establishing robust recycling standards by developing a comprehensive framework in consultation with experts and implementing certification programs for recyclers, to minimize environmental impact, promote material recovery, and drive innovation in recycling processes.

LONG TERM

Periodic review of regulations

Conducting periodic review of the regulatory landscape with respect to environmental regulation compliance applicable to the electronics manufacturing industry, and also have sunset clauses in the rules (wherever applicable).

Iron out lacunae in the consultation process

Establish a robust consultation and discussion process (including feedback loops), based on the good practices mentioned above (including institutionalizing undertaking RIA/feasibility study)

Balance the interests of all stakeholders

Given the large gamut of stakeholders involved in the electronics manufacturing industry, as well as the stakeholders working on the imperative of environmental protection, the WG shall recommend principles to adopt in regulation making, which promote balancing the interests of all such stakeholders, through mutually beneficial solutions.

Shift from EPR to (Extended Producer Recycler and Regulators) EPRR

Shifting from the concept of EPR to EPRR (Extended Producer Recycler and Regulators) responsibility entails broadening the scope of accountability to include not only producers but also recyclers and regulators, fostering a collaborative approach towards environmental sustainability in the electronics manufacturing industry.

Integrate carbon credit for EPR eertificates

Integrate Carbon Credits for EPR certificates as part of the regulatory framework for the electronics manufacturing industry. This innovative approach would incentivize environmentally responsible practices, providing tangible economic benefits tied to carbon reduction initiatives, thus fostering sustainability and encouraging compliance efforts.

Cross-departmental collaboration

Cross-departmental engagement, such as between CPCB, Customs, and GST departments, is crucial for effective enforcement of regulations, enabling initiatives like linking ICEGATE and GST portal with the CPCB portal for put on market data validation. Additionally, collaboration between CPCB and Customs departments can strengthen gatekeeping checks to regulate the entry of registered brands into the Indian market, ensuring compliance with environmental regulations in the electronics manufacturing industry.

4.2 Conclusion

It is apparent that there are significant challenges related to EoDB, particularly concerning environmental clearances, for the electronics manufacturing industry in India. To mitigate these challenges effectively, there is a pressing need for a fundamental overhaul of the policy-making methodologies of EoDB governed by the MoEFCC and the CPCB, specifically in the context of regulating the management of plastic, electronics, and battery waste. Streamlining and modernizing these regulatory approaches can substantially enhance the industry's operational efficiency and environmental sustainability. Adopting the above recommendations will present a substantial opportunity to enhance the industry's operational efficiency and environmental sustainability.

Ultimately, taking a proactive approach to waste management policies creates a sense of partnership between the government and other stakeholders (including industry). This partnership, founded on collaboration and adaptability, holds the potential to lead us towards a more sustainable and prosperous future for all stakeholders.

NOTES

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