GOVERNMENT OF KERALA

Abstract

Local Self Government Department- Policy on Extended Producer Responsibility - Approved -Orders issued

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LOCAL SELF GOVERNMENT(WM)DEPARTMENT

G.O.(Rt)No.1688/2025/LSGD Dated,Thiruvananthapuram, 06-07-2025

Read 1. Letter No. SM/932/2024-C3 dated, 07/01/2025 from the Executive Director, Suchitwa Mission

ORDER

Extended Producer Responsibility (EPR) can play a pivotal role in transforming Kerala's waste management landscape. By making producers responsible for the end-of-life impact of their products, EPR encourages the design and production of goods with minimal waste and easier recyclability. This policy can significantly reduce the waste burden on local bodies, as producers will have incentives to reduce waste and to invest in recycling initiatives. Extended Producer Responsibility (EPR) can also foster a Circular Economy in Kerala, where materials are kept in use as long as possible and thus waste is minimized. Implementing Extended Producer Responsibility (EPR) will require collaboration between producers, consumers, local governments, and waste pickers, who all can benefit from a more efficient and sustainable waste management system.

As per the letter, read above, Executive Director, Suchitwa Mission has

furnished the draft Policy on Extended Producer Responsibility which was framed after conducting various consultations involving various stakeholders.

Government have examined the matter in detail and are pleased to approve the Policy on Extended Producer Responsibility as enclosed below.

(By order of the Governor)
ANUPAMA T V I A S
SPECIAL SECRETARY

The Principal Director, Local Self Government Department
The Executive Director, Suchitwa Mission
The Member Secretary, Kerala State pollution Control Board
The Executive Director, Kudumbashree
The Project Director, Kerala Solid Waste Management Project(KSWMP)
The Managing Director, Clean Kerala Company Ltd.
The Project Director, KSIDC
The Director General, KILA
All Secretaries of LSGI (through the Principal Director, LSGD)
All Joint Directors, LSGD (through the Principal Director, LSGD)
The Executive Director, Information Kerala Mission
Director,(I&PRD), Web & New Media
Stock File/Office copy

Forwarded /By order
Signed by
Manish V V
Date: 07-07-2025 10:35:15
Section Officer

Copy to:- Private Secretary to Hon'ble Minister LSGD
PA to Special Secretary LSGD

Extended Producer Responsibility Policy for the State of Kerala

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Preface

The State of Kerala brought out the State Policy on Solid Waste Management in 2018. The Policy specified the need for implementing the Extended Producer Responsibility in the State for the purpose of engaging with generators of Waste with the objective of ensuring that they work out modalities for collecting back/ managing the waste they introduce into the market. In 2022 the Central Pollution Control Board (CPCB) issued the guidelines on Extended Producer Responsibility (EPR) for Plastic Waste under the ambit of Plastic Waste Management Rules 2016 and subsequently other EPR rules for waste streams such as e-waste under ambit of E-Waste Management Rules, 2016, battery waste under the ambit of Battery waste Management Rules, 2022, used tyres and used oil under the ambit of Hazardous and other Wastes (Management & Transboundary Movement) Rules, 2016 aligning with respective parent regulations. The Kerala State Pollution Control Board has been engaged in the process of registering all obligated entities mandated under EPR and ensure the compliance aspects of waste management.

Meanwhile the Local Self-Government Department (LSGD) of the Kerala Government has undertaken the enactment of a State Policy on EPR which will be used as a guidance document on the framework for EPR implementation in the State. This document shall and will align with national rules as well as the statewide Malinya Muktha Nava Keralam Campaign aimed at making the state litter free. While the initial frameworks where introduced around EPR focused on plastic packaging and commodities, in anticipation of EPR being extended to

other categories of non- biodegradable waste (e-waste, used tyres, used oil, and battery waste) as well, this policy is intended to be an overarching policy applicable to other categories of non-biodegradable waste as well. The purpose of the policy is to ensure the effective management of different categories of non-biodegradable waste, promote recycling and other principles of circular economy, and create a sustainable ecosystem that involves key stakeholders such as local bodies, industries, and government agencies.

Extended Producer Responsibility (EPR) can play a pivotal role in transforming Kerala's waste management landscape. By making producers responsible for the end-of-life impact of their products, EPR encourages the design and production of goods with minimal waste and easier recyclability. This policy can significantly reduce the waste burden on local bodies, as producers will have incentives to reduce waste and to invest in recycling initiatives. EPR can also foster a circular economy in Kerala, where materials are kept in use for as long as possible and waste is minimized. Implementing EPR will require collaboration between producers, consumers, local governments, and waste pickers, who can all benefit from a more efficient and sustainable waste management system.

The Policy has been framed after conducting various consultations involving the various stakeholders. Wide dissemination will be given to the document in order to promote an environment which supports the three R approach including reduction of materials which are non-recyclable. Furthermore, the policy seeks to promote the establishment of new recycling units through various initiatives, including allocating space in industrial estates and collaborating with active organizations locally.

1. Background

Kerala's solid waste management strategy follows decentralised waste management system in accordance with the constitutional and legal framework governing waste management in India, emphasising the importance of local self-governance and community participation. The State generates approximately 2.5 million tonnes of waste annually, a significant portion of which consists of organic waste, plastics, e-waste, and other hazardous materials. The main steps to deal with this waste is source level proper segregation and treatment of biodegradable waste, door to door collection of non-biodegradable waste, storage and further segregation at local self- government level and followed by sale to registered recyclers and waste processors.

On the ground, waste management is the responsibility of the local self-governments and they are supported by different agencies of the Local Self-Government Department such as the Suchithwa Mission and the Clean Kerala Company Ltd. On the ground, regulatory and enforcement functions relating to waste management is also carried out by the local self-governments. Additionally, regulatory functions such as monitoring of environmental standards are also carried out by the State Pollution Control Board. The State has also been deploying the services of Micro enterprises under the Kudumbashree Mission, the Haritha Karma Sena for carrying out the door to door collection of household and institutional waste and further segregation.

Currently there is very little engagement by Producers of goods directly to support the management of waste on the ground. Private entities including recyclers and private companies engaged in handling of waste are the only actors in this sector. EPR offers an opportunity to

leverage funds for collection, creating enabling systems for segregation, setting up of recycling/ waste processing facilities and expertise from producers of products to handle the materials which they have introduced into the market.

2. Extended Producer Responsibility

EPR is a broad principle which vests responsibility in a Producer of a product for the environmentally sound management of the product till the end of its life. Originally premised on the Polluter Pays principle, it seeks to go beyond mere shifting of the financial burden of waste management from end users or government to the Producer. Its primary aim is to fundamentally transform the relationship between product design and waste generated. By holding producers responsible for the environmental impacts of their products throughout the product lifecycle, EPR incentivizes producers to innovate in terms of materials used, product design, and packaging so that the environmental impact is minimized. This could lead to less production of reject and inert materials, increased use of recyclable materials, designs that allow for easier disassembly, and reduction in the use of harmful substances.

EPR aims to reduce the total environmental impact by using administrative, economic, and informative instruments. This approach not only promotes sound product design and robust governance but also integrates local municipalities in collection and processing efforts with funding support from producers for the collection and processing of waste. EPR aligns with the principles of the circular economy by incentivizing producers to use environmentally friendly materials, ensure end-of-life product management, and implement cost-beneficial recycling mechanisms. By fostering responsibility across the product

lifecycle, EPR encourages waste prevention, resource conservation, and pollution prevention, thereby advancing the circular economy.

EPR was initially introduced in India under the Plastic Waste Management Rules, 2016 and E- waste Management Rules, 2016 which envisage a system for making the Producers liable for safe and scientific disposal of plastic packaging and electronic waste respectively. The EPR regime for plastic packaging in India has grown maturely and has mandated Producers, Importers, Manufacturers and Brand Owners (PIMBO) of plastic packaging to establish circularity in the plastic packaging produced by ensuring recycling, incorporating recycled content, promoting reuse and adopt waste processing as stipulated in the law. EPR policies in India hold manufacturers accountable for managing post-consumer waste and the entire lifecycle of their products. The current EPR rules (as of 2024) in the country cover waste streams such as plastic packaging, e- waste, used tyres, used oil, and battery waste, aligning with respective parent regulations (as explained in section 2.4 of this document). The present policy on EPR is a broad Policy targeting different streams of non-biodegradable waste and its management following circular economy.

1. Vision

The policy on EPR envisages a scenario where different modalities for operationalization of EPR can be explored for the purpose of ensuring better management of different types of non- biodegradable waste by the local self-governments and other waste management agencies of the State by leveraging funds and expertise of the relevant stakeholders, in a manner so as to make waste management in the state sustainable and employment generating.

2. Guiding Principles

The following guiding principles are to guide action in EPR in the State:

i. Abidance to the Reduce, Reuse, Recycle approach.

ii. Operationalisation of circular economy for the state of Kerala.

iii. Leverage of EPR related funds for collection and transport of waste by authorized collectors in the state.

iv. Implementation of mechanisms such as Green Protocol and Zero Waste.

v. Promotion of alternatives.

vi. Encouraging private sector investment in recycling in the state and superior technologies for waste management.

vii. Promote Public Private Partnerships (PPP) by the state.

viii. Phase out by Producers of rejects and inert materials which is non - recyclable or non - energy recoverable or with no alternate use.

ix. Encouraging take back by Producers of rejects and inert materials.

x. Abidance by the principle of Polluters' Pay.

3. Objectives

The policy is designed with the objectives of:

i. Defining the scope of EPR in the State.

ii. Define the broad framework for operationalizing EPR in the State.

iii. Define roles and responsibilities of various stakeholders.

iv. Set goals and targets for the State.

4. Legislative Background

The legislative framework that governs waste management in Kerala falls under the Rules framed under the Environment Protection Act, 1986. The Rules define the roles, responsibilities, and obligations of various stakeholders involved in the process and defines mandatory steps to be taken for handling different types of waste. The scope of EPR for specific types of waste under the various Rules is briefly explored below:

- The Solid Wastes Management Rules, 2016: These rules lay out the mandates of waste segregation at the source and prescribe standards for composting, landfilling, and other waste processing technologies. They also hold that local self-governments are responsible for the collection, segregation, storage, transportation, processing, and disposal of municipal solid waste. As per the rules, Section 17, Manufacturers or brand owners of disposable products, including tin, glass, and plastic packaging, are required to provide financial support to local authorities for waste management systems. They must also establish systems to collect and manage non-biodegradable packaging waste generated by their products. For sanitary napkins and diapers, these companies should explore the use of recyclable materials or provide disposal pouches or wrappers with their products. Additionally, they must educate consumers on the

proper disposal of solid waste.

- The Plastic Waste Management Rules, 2016: These rules focus on minimizing the generation of plastic waste, enhancing recycling efforts, and reducing the use of plastic materials. The Plastic Waste Management Rules mandate EPR for all producers, importers, manufacturers and brand owners (PIMBOs) of plastic packaging. These regulations require PIMBOs to establish systems (work jointly with local bodies and provide financial assistance) for the collection, recycling, and processing of waste in authorized plastic waste processing units. The rules include provisions for mandatory registration on a centralized EPR portal, and obtain authorization from the CPCB/ SPCB setting collection targets, and introducing EPR Certificates to ensure meeting of EPR targets, recycling/ reuse targets and incorporation of recycled content. MoEF&CC notified Amendment to PWM Rules on March 14, 2024 as per which the Micro & Small Producers, Sellers, Manufacturers & Importers of raw materials shall have to register with concerned SPCBs/PCCs in accordance with provision of PWM Rules, 2016 on the centralized EPR portal developed by CPCB.

- The E-Waste (Management) Rules, 2016: These rules regulate the management of electronic waste, or e-waste, focusing on the recycling and reduction of hazardous substances used in electronics. Similar to the Plastic Waste Management Rules, they incorporate principles of EPR, requiring manufacturers to facilitate the collection and recycling of electronic waste. Producers of electronic goods must establish collection facilities (working closely with local bodies and private authorized agencies), provide financial assistance for collection and further channelisation of waste to authorized

recyclers/ refurbishers, create EPR plans detailing their e-waste management strategies, and obtain authorization from KSPCB.

- Battery Waste Management Rules, 2022: Battery Waste Management Rules 2022 require producers to manage the lifecycle of batteries, from collection to recycling. Producers must establish collection systems, submit EPR plans for battery management, and meet specified recycling targets. The rules also mandate the creation of collection centers and consumer awareness campaigns to facilitate the proper disposal and recycling of used batteries.

- The Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016: Hazardous and Other Wastes (Management and Transboundary Movement) Amendment Rules, 2022 introduce an EPR framework for the management of waste tyres, requiring producers and importers to establish systems for the collection, recycling, and disposal of waste tyres. The rules promote the recycling of waste tyres into specific end products such as reclaimed rubber, crumb rubber, crumb rubber modified bitumen (CRMB), recovered carbon black, and pyrolysis oil or char. Producers and importers must register on a centralized portal and report their tyre waste management activities.

- Hazardous and Other Wastes (Management and Transboundary Movement) Second Amendment Rules, 2023 mandates producers and importers to manage the entire lifecycle of used oil, from collection to environmentally sound recycling. The regulations cover various types of oils, including base oil, hydraulic oil, transformer oil, engine oil, and more. Entities involved in the used oil management chain must register on the CPCB portal, fulfill EPR

obligations, and file regular returns detailing their activities.

5. Kerala's EPR Ecosystem

Role of Local-Self Government Department (LSGD), Government of Kerala:

The State Government, particularly the LSGD, plays a crucial role in implementing and managing the waste streams of plastic packaging, e-waste, used tyres, used oil, and battery waste. Their responsibilities encompass policy formulation, support and coordination for collection and transport of waste, establishment of authorized waste processing facilities in PPP model and training and capacity building of LSG institutions.

LSGD is responsible for supporting and coordinating with various stakeholders involved in the management of each waste stream. This includes ensuring that state agencies and departments are aligned with the goals and regulations set forth in the respective management rules for plastic packaging, e-waste, used tyres, used oil, and battery waste.

The State Government formulates state-specific policies and plans that align with national regulations to ensure effective waste management. They ensure that local bodies and municipalities are adequately informed and equipped to handle their responsibilities. This involves creating frameworks that support the efficient collection, segregation, and recycling of waste, and ensuring compliance with EPR obligations.

Capacity Building: The State Government facilitates training and capacity-building programs for local bodies, municipalities, and other

stakeholders to enhance their capabilities in managing waste effectively. This includes providing the necessary resources and training to handle the collection, recycling, and disposal of plastic packaging, e-waste, used tyres, used oil, and battery waste.

Specific Waste Streams:

- For plastic packaging, the State Government ensures local bodies are aware of and comply with the Plastic Waste Management Rules. They support the establishment of collection and recycling systems and facilitate public awareness campaigns.

- In managing e-waste, the State Government coordinates with producers and recyclers to implement the E-Waste (Management) Rules. They help set up collection centers and ensure local bodies have the necessary resources and training to handle e-waste.

- For used tyres, the State Government implements the Hazardous and Other Wastes (Management and Transboundary Movement) Amendment Rules, 2022. They support the creation of collection points and recycling facilities, and may coordinate with local bodies to manage tyre waste effectively.

- The management of used oil under the same amendment rules involves the State Government facilitating the establishment of collection points and ensuring that used oil is properly collected, transported, and recycled. They may ensure local bodies comply with the regulations and support public awareness initiatives.

- In managing battery waste, the State Government ensures compliance with the Battery Waste Management Rules. They coordinate with producers and local bodies to establish efficient

collection and recycling systems, facilitate training programs, and support policy implementation at the local level.

Role of Industrial Department, Government of Kerala:

The Kerala Industrial Department, and its institutions KINFRA, KSIDC, DIC, guided by the 2023 Industrial Policy[1], plays a crucial role in addressing the state's waste management challenges through the implementation of EPR. The department can support the management of plastic packaging, e-waste, used tyres, used oil, and battery waste by establishing dedicated recycling facilities and promoting advanced waste processing technologies like waste- to-energy projects, and other procurement policies favoring recycled products.

The Industrial Department will also facilitate partnerships with NGOs, private entities, and industries to streamline waste management processes working closely with LSGD. Additionally, aligning to the state Green Enterprise Development Policy in the Waste Management Sector financial incentives and subsidies to businesses adopting sustainable practices for waste management will be promoted. These initiatives aim to improve Kerala's waste management infrastructure, promote environmental sustainability, and support the growth of responsible entrepreneurship in the state.

[1] KERALA INDUSTRIAL POLICY 2023,

https://industry.kerala.gov.in/images/pdf/2023/IND_POLICY_ENG.pdf

Role of Kerala state pollution Control board (KSPCB):

KSPCB plays a pivotal role in managing EPR for various waste streams, including plastic packaging, e-waste, used tyres, used oil, and

battery waste. It ensures the registration of relevant entities through centralized portals, conducts inspections and audits to verify compliance with respective management rules, and promotes environmentally sound recycling practices. The SPCB facilitates the legally compliant establishment of collection points, compiles and submits compliance reports to the CPCB and enforces regulations by levying penalties on non-compliant entities. Additionally, it coordinates with local bodies to support effective waste collection and recycling/ waste processing units, enabling local bodies for the transfer of EPR credits. thereby ensuring sustainable waste management across these waste streams.

Local governments (urban and rural) :

Local bodies play a crucial role in managing EPR for various waste streams. They facilitate the establishment of collection points and ensure the proper segregation and transportation of waste to EPR registered and authorized recyclers or processing facilities. Local bodies support public awareness campaigns about proper waste disposal and recycling practices and collaborate with producers and state pollution control boards to ensure compliance with EPR regulations.

Labour Department:

The Labour Department can play a crucial role in formalizing the roles of informal waste workers and integrating them into the EPR framework. This formalization process will ensure that informal sector workers, such as waste pickers, receive fair wages, social security benefits, and legal recognition within the waste management system. Given the hazardous conditions of waste management work, the

Labour Department may establish safety guidelines and ensure that waste workers have access to personal protective equipment and safe working environments. Regular inspections, as well as workplace safety standards, can minimize occupational risks and make waste management jobs safer. The implementation of EPR policies will lead to increased demand for labor across various activities such as waste collection, sorting, and recycling. The Labour Department can collaborate with other stakeholders to support sustainable job creation in this sector, providing stable livelihoods for workers and contributing to local economic growth. As the EPR system expands, the Labour Department can ensure that workers, particularly those in the recycling and waste processing sectors, have access to social security, healthcare, and other benefits. This will make the sector more attractive to workers, leading to a more motivated and reliable workforce.

As per the national rules and regulations, under EPR act as well as parent rules cited in section 2.4, the EPR mandates roles and responsibilities of different stakeholders as explained in detail for different streams of waste: 1. plastic packaging, 2. e waste, 3. used tyres, 4. used oil, 5. battery waste.

A. EPR for Plastic Packaging & commodities made from compostable plastics or biodegradable plastics

The EPR legislation for plastic packaging in India makes it mandatory for Producers, Importers, Manufacturers, Brand Owners (PIMBOs), to establish circularity in the plastic packaging produced by ensuring

recycling and its appropriate disposal. A broader insight has been made with the release of the EPR guideline for Plastic Packaging by the Ministry of Environment, Forest, and Climate Change (MoEFCC) in February 2022. The EPR obligations and provisions of the new guidelines apply to Plastic Waste processors or recyclers, plastic packaging producers, importers, and Brand Owners, including online platforms /marketplaces and supermarkets /retail chains.

EPR applies to both preconsumer[2] and post-consumer[3] plastic packaging waste. EPR is applicable for (i)Category I- Rigid plastic packaging; (ii)Category II- Flexible plastic packaging of single layer or multilayer (more than one layer with different types of plastic), plastic sheets or like and covers made of plastic sheet, carry bags, plastic sachet or pouches; (iii)Category III- Multilayered plastic packaging (at least 1 layer of plastic and at least one layer of material other than plastic); (iv)Category IV - Plastic sheet or like used for packaging as well as carry bags & commodities made of compostable plastics (v) Category V- Plastic sheet or like used for packaging as well as carry bags & commodities made of biodegradable plastics

An online web portal has been launched by CPCB to ensure compliance with EPR. The Portal is not just limited to the registration of the PIBOs, Recyclers/Plastic waste processors but also acts as a single point data repository for implementing EPR guidelines in the country.

[2] ***Pre-consumer plastic packaging waste"*** *means plastic packaging waste generated in the form of reject or discard at the stage of manufacturing of plastic packaging*

and plastic packaging waste generated during the packaging of product including reject, discard, before the plastic packaging reaches the end-use consumer of the product.

[3] ***Post-consumer plastic packaging waste"*** *means plastic packaging waste generated by the end-use consumer after the intended use of packaging is completed and is no longer being used for its intended purpose.*

Role of Key Stakeholders

- CPCB is responsible for registering PIMBOs, plastic waste processors through an online portal, conducting inspections and audits to ensure compliance with EPR guidelines, and annually publishing lists of entities that fail to meet their EPR targets. Additionally, CPCB establishes mechanisms for stakeholder dialogue, conducts bi-annual surveys to analyze plastic waste composition, and reviews waste management technologies.

- KSPCB ensures the registration of PIMBOs (registration is granted to PIMBOs operating in less than 2 states) in CPCB centralized portal and plastic waste processors, conducts physical inspections and audits, and publishes annual Exception Reports listing non-compliant entities.

- Local bodies, both urban and rural, can function as feedstock suppliers of waste to authorized Plastic Waste Processors (PWPs), get the credits from the PWPs and sell to PIMBOs or get registered as PWPs by issuing EPR certificates through their recycling facilities which is set up in PPP model with NGOs or private

companies. The EPR obligated entities (financial, logistical or infrastructure) support the local bodies for channelizing waste through authorized collectors namely Haritha Karma Sena and working with government or private sector agencies.

- PIMBOs [*Producers of plastic packaging (excluding micro and small enterprises as per the Micro, Small, and Medium Enterprises Development Act, 2006); Importers of plastic packaging, including intermediate materials used in manufacturing plastic packaging like films and preforms, and plastic packaging of imported products; Brand Owners, including online platforms/marketplaces and supermarkets/retail chains, excluding those classified as micro and small enterprises under the same Act; Manufacturers and importers of plastic raw material; Manufacturers of items made from compostable plastics or biodegradable plastics*] must register through the CPCB's portal, submit Action Plans with EPR targets, implement collection schemes such as deposit-refund systems, file annual returns, establish collection points or Material Recovery Facilities (MRFs), and coordinate with local bodies (with financial and logistics support) for regular waste collection, transport and disposal at authorized waste processors.

- Plastic Waste Processors (PWPs) [*means recyclers and entities engaged in using plastic waste for energy (waste to energy), and converting it to oil (waste to oil), industrial composting*] are required to register with their SPCB through the CPCB portal, submit detailed annual returns, and issue certificates for processed plastic waste to PIMBOs.

B. EPR for E-Waste Management

The MoEFCC has notified the E-Waste (Management) Rules, 2022 introducing EPR regime for e-waste management. They apply to all manufacturers, producers, refurbishers, dismantlers, and recyclers of electrical and electronic equipment (EEE) listed in Schedule I of the rules, excluding waste batteries, packaging plastics, micro enterprises, and radioactive wastes.

All stakeholders must register on the CPCB portal. The rules cover 106 EEE categories and set annual e-waste recycling targets based on previous sales. The management of solar PV modules/panels/cells is included, with specific guidelines for their waste up to 2034-2035. The rules mandate the reduction of hazardous substances in EEE, enforce registration, skill development, and safety monitoring for e-waste workers. Solar PV manufacturers must register, store waste per CPCB guidelines, file annual returns, and maintain distinct inventories. Recyclers must recover materials as specified by CPCB guidelines.

Role of Key Stakeholders

- CPCB: CPCB is responsible for the operation and maintenance of the EPR portal and monitoring compliance. It coordinates with SPCBs, issues guidelines and SOPs for e-waste management, and conducts random compliance checks. The CPCB documents and uploads e-waste data, enforces regulations, and conducts training programs for SPCBs and local bodies. It runs awareness programs on e-waste management, integrates stakeholders into a centralized digital system, and submits annual reports to the Ministry. Additionally, the CPCB enforces hazardous substance reduction in EEE manufacturing, interacts with the IT industry to reduce hazardous substances, sets and revises compliance targets, and

ensures RoHS certification through recognized labs.

- KSPCB: KSPCB is tasked with maintaining an inventory of e-waste, ensuring compliance with EPR as directed by CPCB, conducting random inspections of recyclers and refurbishers, and monitoring recycling capacity utilization. It also implements programs to encourage environmentally sound recycling practices and publishes annual reports on compliance.

- Port Authority: The port authority verifies compliance with EPR rules for imports and exports, informs CPCB of any illegal traffic, and takes action against import violations under the Indian Ports Act, 1908, or the Customs Act, 1962.

- Bureau of Indian Standards/Ministry of Electronics and Information Technology: These bodies issue standards for refurbished products and develop guidelines for refurbishers under the Compulsory Registration Scheme.

- Industries department: The state industries department ensures the allocation of industrial space for e-waste dismantling and recycling, recognizes and registers workers involved in these activities, assists in forming worker groups, conducts skill development, and monitors worker safety and health annually.

- Local Bodies (Urban and Rural): Local bodies ensure proper segregation and channeling of e-waste to registered recyclers, manage orphan product collection, facilitate the setup of e-waste systems by providing support for effective collection and transport mechanism through authorized collectors including Haritha Karma Sena so that EPR credits from brandowners or producers may be

obtained at the local body level through recyclers . Local bodies shall conduct training and awareness sessions for public effective e-waste management.

- Manufacturers [*(means a person or an entity or a company as defined in the Companies Act, 2013 (18 of 2013) or a factory as defined in the Factories Act, 1948 (63 of 1948) or Small and Medium Enterprises as defined in the Micro, Small and Medium Enterprises Development Act, 2006 (27 of 2006), which has facilities for manufacture of electrical and electronic equipment as specified in Schedule-I*]: Manufacturers must obtain EPR registration from CPCB, collect e-waste generated during manufacturing, ensure its recycling or disposal, and file annual and quarterly returns on the CPCB portal.

- Producers [*any person or entity who Manufactures and sells electrical and electronic equipment (EEE), including their components, consumables, parts, or spares, under its own brand; Sells under its own brand, assembled EEE and their components, consumables, parts, or spares produced by other manufacturers or suppliers; Sells imported EEE and their components, consumables, parts, or spares; Imports used EEE, regardless of the selling technique used (dealer, retailer, e-retailer, etc.*].: Producers must register on the CPCB portal, implement EPR targets, create awareness through media, and file annual and quarterly returns on the CPCB portal.

- Refurbishers[*Any person or entity that repairs or assembles used EEE listed in Schedule-I to extend its working life beyond the originally intended lifespan for the same use, and subsequently sells*

these refurbished items in the market]: Refurbishers are required to register on the CPCB portal, collect and hand over e-waste generated during refurbishing to registered recyclers, ensure compliance with standards, and file annual and quarterly returns on the CPCB portal.

- Bulk Consumers: Bulk consumers must ensure that their e-waste is handed over only to registered producers, refurbishers, or recyclers.

- Recyclers [*any person or entity engaged in recycling and reprocessing waste electrical and electronic equipment (EEE) or their components to recover precious, semi-precious metals, rare earth elements, and other useful materials. They strengthen secondary sourced materials and operate facilities as outlined in the guidelines of CPCB*]: Recyclers must register on the CPCB portal, ensure compliance with standards, manage non-recycled fractions, maintain records of e-waste activities, and file annual and quarterly returns. They must also accept non-Schedule-I waste, create awareness, account for non-recyclable e- waste, and utilize dismantlers for recycling purposes.

c. EPR for Battery Waste

The Battery Waste Management Rules, 2022, and their amendments establish a comprehensive framework for managing battery waste in India, mandating EPR to hold producers accountable from manufacturing to disposal. Batteries include new or refurbished cells, accumulators, and primary or secondary batteries. "Used battery" refers to batteries with residual life suitable for refurbishment, while "Waste Battery" encompasses used, end-of-life batteries, expired batteries, and discarded batteries.

The rules set collection and recycling targets for various battery types: portable batteries (sealed, under five kilograms, not for industrial use), electric vehicle batteries (for hybrid and electric vehicles), automotive batteries (for starter, lighting, or ignition), and industrial batteries (excluding portable, electric vehicle, and automotive batteries). Producers must ensure environmentally sound recycling or refurbishment to meet specified material recovery percentages for lead, nickel, and lithium. All producers and entities involved in battery manufacturing must register with the CPCB through the online portal.

Role of Key Stakeholders

- CPCB: The CPCB issues guidelines for the collection, storage, transportation, refurbishment, and recycling of waste batteries. It monitors compliance, compiles annual data, submits reports to the Central Government, imposes penalties for non-compliance, and manages the central online portal for EPR activities.
- KSPCB: The KSPCB is responsible for registering entities involved in the refurbishment and recycling of waste batteries through an online portal of CPCB. It verifies compliance through inspections and periodic audits, can suspend or cancel registrations for non-compliance, levies environmental compensation on entities failing to meet obligations, and compiles quarterly and annual reports for the CPCB. Additionally, it publishes annual lists of entities that have not fulfilled their EPR obligations.
- Local Bodies and Municipalities: Local bodies and municipalities may support the collection of waste batteries within their

jurisdictions and ensuring they are handed over to producers or authorized entities for recycling or refurbishment. The expense of collection and transport may be supported by the obligated producers through EPR credits. Local bodies shall also conduct public education campaigns on the importance of proper disposal of waste batteries and collaborate with producers to facilitate the implementation of EPR, providing necessary support and infrastructure to help producers meet their collection and recycling targets.

- Producers (*entities involved in the manufacture and sale of batteries, including refurbished batteries, either as standalone products or within equipment, under their own brand. This includes manufacturing and selling batteries under their own brand, selling batteries and equipment containing batteries produced by other manufacturers under their brand, and importing batteries and equipment containing batteries.*): Producers must register with the CPCB through an online portal, file annual returns detailing the quantity of batteries placed on the market, waste collected, and processed, and achieve specified collection and recycling targets. They must maintain records of EPR certificates obtained from recyclers and implement measures for sustainable production and waste management in accordance with CPCB guidelines.

- Recyclers (*entity engaged in recycling of Waste Battery) and Refurbishers (entity engaged in repairing, re-conditioning, re-purposing of used Battery for its second life*): Recyclers and Refurbishers must register with the SPCBs and provide certificates for processed waste batteries. They are required to submit quarterly returns detailing the quantities of batteries processed and materials

recovered.

D. EPR for Waste tyres

The Ministry of Environment, Forest and Climate Change (MoEF&CC) has notified the Hazardous and Other Wastes (Management and Transboundary Movement) Amendment Rules, 2022. These amendments include provisions for the utilization and management of waste tyres through an EPR regime. Entities required to register on the centralized portal developed by CPCB include producers, recyclers, and retreaders. The rules mandate environmentally sound management of waste tyres, set specific recycling targets, and ensure the registration and tracking of all entities involved in the production, import, recycling, and retreading of tyres. The rules also promote the recycling of waste tyres into products such as reclaimed rubber, crumb rubber, crumb rubber modified bitumen (CRMB), recovered carbon black, and pyrolysis oil or char.

Role of Key Stakeholders

- CPCB: CPCB has mandated the registration of EPR obligated entities on the centralised online portal, file Annual returns, and transact EPR certificate. It specifies standard operating procedures and guidelines for the environmentally sound management of waste tyres, conducts compliance verification and audits, imposes and collects environmental compensation, charges registration and processing fees, and maintains an escrow account for funds collected through environmental compensation.

- KSPCB: KSPCB monitors and enforces compliance with EPR rules at the state level, conducts inspections, provides necessary reports to

CPCB, and coordinates with local bodies for effective waste tyre management.

- Local bodies and municipalities: Local bodies and municipalities may assist in the collection and transportation of waste tyres within their jurisdictions, support awareness campaigns, and ensure local compliance with EPR rules.

- Producers[*Any person or entity involved in the manufacture and sale of new tyres domestically, including those who sell new tyres under their own brand that are manufactured by other suppliers. This also includes entities that sell imported new tyres, import vehicles fitted with new tyres, automobile manufacturers that import new tyres for use in new vehicles sold domestically, and those that import waste tyres.*] : Producers are required to register on the CPCB portal, ensure all activities comply with the rules, fulfill EPR obligations by purchasing EPR certificates, and submit quarterly and annual returns. They must also ensure retreading obligations and disposal of tyres are managed through registered recyclers.

- Recyclers [*Any person or entity engaged in the process of recycling*]: Recyclers must register on the portal, submit information on waste tyre usage and end products produced, generate and sell EPR certificates to producers, and file monthly, quarterly, and annual returns on recycling activities.

- Retreaders [*Means process of renewal of tread and side wall rubber of a worn-out tyre having a good structural quality*]: Retreaders need to register on the portal for the issuance of retreading certificates, submit information related to retreading activities, and comply with EPR obligations by managing end-of-life disposal

through registered recyclers.

E. EPR for Used Oil

The EPR rules for used oil in India establish a comprehensive framework involving multiple stakeholders with specific roles and responsibilities. The Ministry of Environment, Forest and Climate Change amended the Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016, dated 18th September 2023, introducing EPR for used oil management. The types of oils covered include Virgin Base Oil, White Oil, Hydraulic Oil, Transformer Oil, Cutting Oil, Rubber Processing Oil, Thermal Fluids, Anti-Rust Oil, General Purpose Lubrication Oil, Engine Oil, Brake Oil, Grease, Re-Refined/Recycled Base Oil, Gear Oil, Turbine Oil, and Compressor Oil. The CPCB portal serves as a centralized data repository for EPR activities, facilitating registration, return filing, and tracking of used oil. This portal ensures transparency and efficient EPR management, providing a single point for data and compliance monitoring across all states. Entities involved in the used oil management chain must register on the CPCB portal and comply with EPR obligations. Producers and importers can purchase EPR certificates to meet their liabilities, with a potential trading platform for these certificates. The CPCB monitors compliance through inspections and audits, imposing penalties for non-compliance and false information.

Role of Key Stakeholders

- CPCB: CPCB oversees the national implementation of the EPR rules by maintaining the online portal for registration and compliance, preparing guidelines, conducting random checks, and taking action against non-compliance. It coordinates with state

pollution control boards, conducts awareness and training programs, and compiles data on used oil management for annual reporting to the Central Government.

- KSPCB: KSPCB ensures proper implementation of the EPR rules in coordination with the CPCB, facilitates the establishment of collection points by collection agents, support EPR registration on centralised EPR portal monitors compliance with EPR obligations, conducts random inspections, and performs additional functions as directed by the Central Government to support EPR enforcement.

- State Industries department provide industrial spaces for used oil collection and recycling units, ensure the registration and safety of workers, undertake skill development activities, support producers and collection agents in establishing collection points, and collaborate with the CPCB to ensure compliance with EPR rules.

- Local bodies and municipalities: Local bodies and municipalities may facilitate the setup of collection points for used oil, ensure the collected used oil is auctioned or sold to authorized recyclers, and work in collaboration with state governments, SPCBs, and CPCB to support the overall implementation and enforcement of the EPR rules, ensuring local compliance and participation.

- Bureau of Indian Standards (BIS) : BIS will issue standards for re-refined oil within nine months from the commencement of the rules, guiding the production of base oil from recycled used oil to ensure quality and regulatory compliance.

- Producers [*any person or entity that, irrespective of the selling technique (dealer, retailer, e-retailer), (i) manufactures and sells*

base oil or lubrication oil domestically under its own brand, (ii) sells lubrication oil domestically under its own brand using base oil

manufactured by other manufacturers or suppliers, or (iii) sells imported base oil or lubrication oil domestically]: Register on the CPCB portal, meet EPR targets, provide contact details and create consumer awareness about used oil recycling, and file annual returns on the portal.

- Used oil importers [*means any person or entity who imports used oil*]: Importers must register on the CPCB portal, fulfill EPR targets, file annual returns, and ensure that the imported used oil is managed and recycled in an environmentally sound manner, adhering to state-specific regulations.

- Bulk generators [*any entity like automobile industry or railways or defence establishments or a transport company or industrial units or power transmission company or hotels or restaurants and other such entity which is generating more than 100 metric tonnes of used oil per annum*]: Bulk generators must set up collection points for used oil, ensuring it is handed over only to registered recyclers or collection agents, maintaining compliance with state-specific EPR rules.

- Collection agents [a*ny person or entity who collects used oil and supplies it to the recycler*]: Collection agents must register on the CPCB portal, collect used oil from generators, supply it to registered recyclers, and file quarterly and annual returns on the portal, providing detailed information to ensure state-specific compliance with EPR rules.

- Recyclers [*any person or entity engaged in the process of recycling of used oil*]: Recyclers are responsible for the environmentally sound recycling of used oil, including its safe handling, storage, and transportation. They must also file quarterly and annual returns detailing their recycling activities and compliance with state-specific regulations**.**

6. Deposit Refund Schemes (DRS)

Not a separate Model in itself, DRS can be implemented in combination with other EPR Models stipulated above involving LSG while exploring the opportunities of sharing the revenue. DRS can be operationalised by charging a deposit fee at the point of purchase, which is refunded to the consumer when the product is returned. DRS incentivizes consumers to return used products (PET bottles etc) for waste processing specifically leading to significant increases in recycling rates, especially of better quality. DRS system includes specifying deposit values and the conditions under which deposits are refunded, typically through the return of used products like containers to designated collection points. Investments in infrastructure, such as reverse vending machines (RVMs) and manual return points, are necessary to facilitate the efficient collection and processing of returned items. The concept of DRS is to strengthen the EPR systems and also strengthen the informal collection economy; where informal sector is already active DRS will strengthen transparency and monitoring in the state of Kerala.

By providing a financial incentive for consumers to return used containers, DRS ensures a higher return rate and better quality of

materials for recycling. This targeted collection system can isolate high-value materials like PET bottles and aluminum cans, making them more suitable for high- quality recycling processes. Additionally, the DRS framework can include eco-design incentives, where producers are encouraged to design products that are easier to recycle or reuse, thus promoting sustainability from the production stage.

When integrated with EPR policies, DRS can create a more robust waste management system. EPR schemes typically involve producers taking financial responsibility for the end-of-life management of their products, including collection, recycling, and disposal. By incorporating a DRS, specific high-value or problematic waste streams can be managed more effectively, while EPR covers broader categories of waste. This dual approach allows for the optimization of waste collection infrastructure and the achievement of higher recycling targets.

DRS provides a direct financial incentive for consumers to return products, significantly reducing littering. This is particularly effective for products that are frequently found in the litter stream, such as single-use beverage containers. Public awareness campaigns and educational initiatives are crucial to encourage consumer participation and compliance with the DRS.

7. Developing reduce, reuse and repair centers in Kerala

Reuse/ repair centers is another modality that will be employed to make EPR more effective. LSGs will enter into Agreements with

Producers to operate refill/repair stations where customers can come and refill/repair their product. Specific health and safety guidelines for the handling, cleaning, and sterilizing of materials to ensure public safety and maintain trust in the system will be done. To promote Public-Private Partnerships incentives such as reduced taxes or shared funding opportunities for private companies to invest in or manage these centers will be offered.

For plastic packaging, the strategy involves collaborating with manufacturers and retailers, establishing collection and reuse infrastructure. Similarly, for e-waste, the plan includes creating collection centers, establishing repair shops and specialized recycling units, training technicians, and enforcing management laws. For used tyres, the strategy focuses on setting up collection centers, repair facilities, and promoting the repurposing of tyre materials in various applications.

Standards for the physical infrastructure of the centers, including requirements for equipment, technology, and facility layout to optimize operations and ensure environmental compliance must be established. State-of-the-art technology for cleaning and tracking the containers in reuse centres, supported by policies that encourage or subsidize the acquisition of such technology will be promoted.

In alignment with the Green Enterprise Policy, these centers will also foster entrepreneurship by providing subsidized infrastructure and advanced training for sustainable waste management practices.[4]

RRR centres/ Swap Shops

Implementing Extended Producer Responsibility (EPR) through Reduce, Reuse, Recycle (RRR) Centers or Swap Shops can significantly enhance waste management by encouraging the return and repurposing of various waste streams. These centers act as collection hubs where citizens can deposit items such as clothes, shoes, old books, toys, and used plastics, which can be refurbished, reused, or recycled. By integrating EPR into the operational framework of RRR Centers, manufacturers and producers are incentivized to take responsibility for the end-of-life management of their products. This can be achieved by partnering with local municipalities, NGOs, and community groups to facilitate the collection and processing of waste, ensuring that materials are effectively diverted from landfills and reintroduced into the economy.

The RRR Centers supported by robust public awareness campaigns and innovative collection methods such as door-to-door collections and RRR on Wheels, can significantly reduce environmental impact. By geotagging centers and leveraging digital platforms, cities can efficiently guide citizens to the nearest collection points, enhancing participation rates. Moreover, activities such as community participation campaign, flash mobs, and educational programs in schools help embed the principles of waste segregation and recycling in the community. The collaborative effort between urban local bodies, NGOs, and citizens demonstrates a scalable model for EPR implementation, ultimately leading to cleaner cities and a more sustainable future.

Aligning to the Swap shop idea already implemented under the Green Protocol movement in the state, the policy is founded under the idea that*: what is old or redundant for one person can be a valuable*

resource for another.

Key Points of the Initiative:

- Sustainability: By facilitating the reuse of items, swap shops help reduce the volume of waste sent to landfills and decrease the demand for new products, thereby conserving resources and minimizing environmental impact.
- Community Engagement: These shops foster a sense of community and mutual support by encouraging people to contribute to and benefit from shared resources.
- Economic Benefits: Participants in these centres/ swap shops can save money by acquiring needed items for free, which can be particularly beneficial for low-income households.
- Waste Reduction: The initiative directly contributes to waste reduction efforts by keeping still-usable items in circulation for longer periods.

[4] Draft Policy for Green Enterprise Development in the Waste Management Sector-2024, Government of Kerala

8. EPR Implementation

EPR in Kerala will be implemented through a phased approach. Adequate regulatory frameworks, stakeholder engagement, technological adoption, and continuous monitoring and adaptation will be part of this as outlined below:

1. Phased Implementation

A phased approach in collaboration with other relevant Departments including Industries Department allows for the implementation of EPR, helping stakeholders to adapt and systems to evolve without overwhelming existing infrastructure. Options can be explored of utilising existing infrastructure as much as possible.

1. Pilot Phase: A pilot project focusing on one or two high-impact sectors, such as plastics or electronics, which are significant contributors to waste streams in Kerala will be carried out. This will allow for testing the EPR model on a smaller scale to identify potential challenges and make necessary adjustments before a full rollout.

    a. DRS schemes can be piloted for waste streams for instance, working jointly with the LSG department - Waste collection (eg. plastic bottle) centres in tourism destinations working jointly with tourism department, pilgrimage centres with the assistance of Devasom department, beverage bottles with the support of Excise department, transport centers jointly with transport department, railway stations jointly with railways department etc,

    a. EPR credit for collection and transport of waste to authorized waste processors can be discussed between local bodies and authorized processors and agree upon financial terms to manage the

waste.

- The financial arrangement with regard to plastic waste collection and transport and prices for example (for EPR plastics) plastic waste per category can be discussed between the local body and authorized PWP and be decided by levying funds from EPR credit.

- EPR credit for E-waste can also be explored for collection and transport of waste from local bodies to authorized E-waste recyclers.

b. EPR system including credit mechanism be utilized for authorized waste collections- Haritha Karma Sena.

2. Expansion Phase: the program will then be gradually expanded to include additional product categories and larger geographical areas as the initial bottlenecks are worked out and the system begins to stabilize. Expansion will be based on clear criteria such as readiness of the recycling infrastructure, market conditions, and stakeholder preparedness.

3. Full Implementation: Once the system is proven effective in the pilot and expansion phases, there will be full implementation across all relevant product categories and throughout the state. This phase

should also introduce more stringent recycling and recovery targets, backed by robust monitoring and compliance mechanisms.

2. **Incentives and Penalties:**

A system of incentives will be implemented to reward material producers, especially indigenous who exceed recycling and reduction targets and penalties for those who fail to meet their obligations. Industries department as explained in section 2.5 will allocate land in industrial estates and parks for recycling. For monitoring and penalizing entities who have EPR obligations and do not abide by the EPR mandate, the LSGs may support the State Pollution Control Board as may be determined through guidelines. Following incentives and schemes may be provided aligned to the state Green Enterprise Policy[5] :

- **Procurement Policies:**
    - Government procurement policies have to mandate that 5% of materials purchased by government offices and schemes must be composed of recycled materials.
    - Sales benefits such as discounts in taxes and additional incentives shall be extended to promote recycled products in the market.
- **Support for Recycling Units:**
    - Recycling units currently operational or planning to establish in the state will receive discounted land rates and electricity

tariffs, including a power tariff subsidy of ₹2 per unit for the first five years of operation.

- Allocating 10% of land in Industrial Parks/ Estates for recycling purposes, ensuring uniformity across regions, and promoting the establishment of recycling facilities in industrial zones

- **Public-Private Partnerships (PPPs): Initiatives will focus on leveraging private investment in recycling infrastructure, offering:**

  - 50% subsidized land leases in industrial parks for green enterprises.

  - Financial incentives, extended repayment schedules for term loans supporting recycling projects.

[5] Draft Policy for Green Enterprise Development in the Waste Management Sector-2024, Government of Kerala

- **Exemptions on stamp duty and registration charges for green entrepreneurs establishing units in industrial parks.**

3. Stakeholder Engagement and Partnerships

Since successful EPR implementation requires active participation from all stakeholders, this will be achieved through:

1. Education and Awareness Programs: Widespread education and awareness campaigns will be conducted to inform all stakeholders of their roles and responsibilities under the EPR framework. This includes educating consumers on proper disposal practices and the benefits of recycling. The funds for such awareness sessions as per the rules be provided by producers, importers, manufactures and brandowners of respective waste streams like plastics, e-waste, tyres, oil, battery etc.

2. Engagement with the Informal Sector: The informal waste sector will be integrated into the formal EPR process. This will include providing training, resources, and legal recognition to informal waste pickers, ensuring they are part of the official recycling process and also receive EPR credits from the value chain.

4. Technology and Innovation

Leveraging technology and innovation can significantly enhance the efficiency and effectiveness of EPR systems. Strategic investments include:

1. Advanced Recycling Technologies: Advanced technologies will be adopted for waste sorting, processing, and recycling that can handle complex waste streams more efficiently. This may include

automated sorting lines, advanced mechanical and chemical recycling methods, and digital platforms for tracking waste flows. Use of AI systems and advance systems like robotic systems will have to be explored. Advanced recycling ideas and startups will be promoted at the state.

2. Product Design Innovations: Innovation in product design that facilitates easier recycling and less waste will be encouraged and supported through research and development incentives for producers.

3. Marking and labelling systems: All products, including plastic packaging, electronic materials, tyres, oil, and batteries, must feature clear and standardized marking and labelling to facilitate proper waste management and compliance with EPR regulations. All the marking and labelling systems must align to the national rules and framework as published by MoEFCC. Mandatory information on labels includes a recycling symbol specific to the type of waste, the EPR registration number, the manufacturer's name and contact information, the date of manufacture, and instructions for proper disposal or recycling. Additionally, unique identification codes for tracking and information on hazardous substances must be included where applicable. These labels must be durable, prominently placed for easy visibility, and adhere to standardized formats to ensure consistency and ease

of understanding. Regular audits and inspections are essential to maintain compliance with these marking and labelling requirements. This approach ensures that consumers are informed about the recyclability and proper disposal of products, thereby supporting effective waste segregation, recycling, and environmental conservation.

5. Community and Consumer Engagement

Since robust community and consumer engagement is essential for EPR to be effective in Kerala, steps will be taken for enhancing this. This will be good for ensuring that EPR initiatives are supported by a well-informed and actively participating public.

The first step in effective engagement would be to understand consumer behavior and the factors that influence how consumers handle waste. This will involve identifying barriers to recycling and proper waste disposal, such as lack of awareness, inconvenience, and insufficient incentives. Research and surveys will be conduct to gain insights into consumer attitudes and behaviors, which will then be used to inform targeted strategies to encourage more sustainable practices. This can be carried out jointly with NGOs, civil society organizations, academic institutions etc.

6. Educational Campaigns

1. Comprehensive Awareness Programs: Widespread

educational campaigns that cover the importance of recycling, the benefits of EPR, and the role of consumers in the lifecycle of products will be implemented. These campaigns will be conducted using various mediums such as television, radio, social media, and community workshops to reach a broad audience.

2. Schools as Learning Centers: Waste management and sustainability will be integrated into school curricula in order to cultivate a culture of environmental responsibility from a young age. These schools will therefore serve as central hubs for community recycling programs, fostering early consumer engagement.

3. Involvement of Local Influencers: Local community leaders, celebrities, and influencers will be engaged to help amplify the message, making it more relatable and widely accepted.

7. **Facilitating Consumer Participation**

1. Convenient Recycling Options: Recycling facilities will be made accessible and recycling will be made convenient. Multiple collection points and home collection services will be arranged for large or hazardous items, and integrating recycling within local shopping areas and community centers. PPP models can be explored in this regard.

2. Incentive Programs: Reward systems will be introduced for consumers who actively participate in recycling programs which can significantly boost engagement. Incentives may be in the form of discounts, loyalty points, or even small financial returns for returning used products or packaging.

3. Use of Technology: Apps and digital platforms that make it easier for consumers to know what, where, and how to recycle will be developed which will increase participation rates. These tools will provide information on the nearest recycling centers, the types of materials accepted, and how the recycling process contributes to environmental sustainability.

8. Building Community Partnerships

1. Collaborations with NGOs and Local Organizations: Partnerships with NGOs and community-based organizations will be created to leverage their local knowledge and networks to enhance EPR initiatives. These organizations can be engaged in conducting door-to-door campaigns, organizing community clean-up drives, and to facilitate local recycling events.

2. Public-Private Partnerships: Partnerships between local governments and private companies will be encouraged which can lead to the development of

more efficient waste management infrastructure. These partnerships will also involve local businesses in sponsoring recycling bins, hosting awareness events, and supporting community waste reduction initiatives.

3. Business consortiums: Formation of business consortiums will be encouraged especially between local producers which can help them maximise gains and streamline operations with similar processes.

4. Community-Based Monitoring: Options for engaging community members (like residential associations) in monitoring local waste management practices will be explored which can help maintain transparency and accountability. This could involve training community volunteers to oversee the collection and sorting processes and report any issues or deviations from standard practices.

9. Engaging Special Interest Groups

1. Youth Engagement: Engaging youth groups and schools in sustainability projects and competitions can encourage innovative ideas and increase awareness among young people. Youth engagement will be explored so that they may act as powerful advocates for change within their families and social circles.

2. Involving Vulnerable Populations: Special attention may be given to include vulnerable populations in the recycling economy. Programs will be designed to support low-income families in participating in recycling schemes which can ensure broader community involvement and social equity.

10. Regular Feedback and Adaptation

1. Feedback Mechanisms: Clear and accessible channels will be established for consumers to provide feedback on waste management services which will help identify areas for improvement. Possibilities for regular surveys, community forums, and digital feedback platforms will be explored which can facilitate ongoing dialogue between consumers and waste management authorities.

2. Adaptive Strategies: Consumer engagement strategies will be kept flexible and adaptive, allowing for adjustments based on feedback and changing community needs. Regular review of engagement programs and their effectiveness in achieving desired outcomes is essential for continuous improvement.

11. Monitoring and Reporting

Effective monitoring and reporting are critical for EPR. They will ensure that the goals of the EPR are met, that all stakeholders are

accountable, and that the program adapts over time to remain effective. A robust monitoring and reporting framework will be established to ensure the successful implementation and sustainability of EPR initiatives.

1. Regular Reporting Schedules: Regular schedule for reporting EPR results, such as quarterly or annually may be designed. This schedule should be known to all stakeholders, and reports should be made publicly available to ensure transparency.

2. Stakeholder Reports: All stakeholders, including producers, waste collectors, and recyclers may be required to submit regular reports detailing their compliance with EPR mandates. These reports may include data on the amount of waste collected, recycled, and any challenges faced in the process.

3. Public Accessibility of Reports: Ensure that all EPR monitoring reports are easily accessible to the public. This can be facilitated through a dedicated section on the official state environmental agency's website, where reports and data can be viewed and downloaded.

Use of Technology in Monitoring

1. Digital Tracking Tools: Implement digital tools such as blockchain for tracking waste from its origin to recycling or disposal. This can provide a tamper-proof record of the waste journey, ensuring transparency and accountability.

2. Mobile Applications: Develop mobile applications for consumers to track their own waste disposal and recycling efforts, which can also serve as educational tools to inform them about proper waste management practices.

3. Data Analytics: Utilize advanced data analytics to process the information collected through various digital platforms to identify trends, predict future waste generation patterns, and optimize waste collection routes and recycling processes.

12. Establishing a Comprehensive Monitoring Framework

1. Baseline Data Collection: Before implementing EPR, baseline data on current waste management practices, recycling rates, and waste generation per capita will be collected. This data will serve as a benchmark against which the success of the EPR program can be measured.

2. Key Performance Indicators (KPIs): Clear KPIs will be developed to monitor the effectiveness of EPR. These will include metrics such as the quantity of waste collected, recycled, and diverted from landfills, as well as producer compliance rates with EPR regulations. Other KPIs may focus on consumer participation rates in recycling programs and the environmental impacts of waste management practices, such as reductions in greenhouse gas emissions.

3. Regular Data Collection and Analysis: Systems will be implemented for ongoing data collection that allow for real-time monitoring of EPR KPIs. This could involve the use of technology such as RFID tags on waste items, digital tracking systems for waste collection trucks, and online platforms for reporting by stakeholders.

13. Compliance Monitoring

1. Audits and Inspections: Conduct regular audits and inspections of producers, waste management facilities, and recyclers to ensure that they comply with EPR regulations. These should be carried out by trained officials and may include random checks to prevent non-compliance.

2. Penalties for Non-Compliance: Establish clear penalties for stakeholders who fail to meet their EPR obligations. This could include fines, revocation of licenses, or public naming of non-compliant entities, which can act as a deterrent against non-compliance.

3. Incentives for Exceeding Targets: Conversely, provide incentives for stakeholders who exceed their EPR targets. These incentives could include tax breaks, public recognition, or other benefits that encourage stakeholders to not just meet, but surpass, their EPR obligations.

9. Future Outlook

Looking ahead, EPR rules for emerging waste streams such as textiles, construction and demolition waste, sanitary waste, and glass may be introduced in future which offers a promising pathway towards sustainable waste management and a circular economy. Future revision of state EPR policies will align with central rules contextualizing to the context of Kerala encompassing the entire product lifecycle, emphasizing design for recyclability, stakeholder engagement, and the integration of advanced technologies for efficient tracking and recycling. Clear delineation of roles and responsibilities, coupled with economic incentives for compliance and penalties for non-compliance, will ensure active participation from producers and other stakeholders.

In the future, educational campaigns and public awareness initiatives will be critical in fostering a culture of recycling and responsible waste disposal. Investment in infrastructure development, including the establishment of collection points and recycling facilities, will further enhance the effectiveness of EPR systems.

"*As the landscape of waste management evolves, the EPR Policy document remains dynamic and adaptable. If new waste streams, such as textiles, construction and demolition waste, sanitary waste, or glass, are brought into discussions under Extended Producer Responsibility (EPR) under the national rules under EPA Act, they will be carefully evaluated and integrated into the policy. This ensures the policy remains comprehensive, addressing emerging environmental challenges and aligning with national and global best*

practices. Regular updates will reflect these additions to maintain relevance and efficacy in sustainable waste management."

3. Conclusion

EPR holds significant potential to revolutionize waste management in the State by reducing the environmental impact of waste, encouraging sustainable product design, and involving producers in waste management. Acknowledging this, steps will be taken to develop clear guidelines and for establishing capacity to operationalise EPR. Collaboration among stakeholders will be facilitated and necessary support provided from the State.