A HANDBOOK
FOR ENFORCEMENT PERSONNEL ON
PLASTIC WASTE MANAGEMENT

Delhi Pollution Control Committee
Government of NCT of Delhi
&
Indian Pollution Control Association

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Government of
National Capital Territory of Delhi

Foreword

The estimated amount of plastic waste generated in Delhi is approx. 2,30,525 tonnes per annum which is 7% of total 3.4 million metric tonnes per annum of plastic waste generated in the country and per capita plastic waste generation rate in Delhi is 13.5 kg per year which is second highest among all states in India. Approx. 43% of the plastic manufactured/ produced is used for packaging purpose only which mostly comprises Single Use Plastic (SUP). The challenges associated with collection and processing/treatment of SUP are well known to all. This leads to pollution of air, water and soil. In Indian context, a circular economy can play a significant role in achieving environmental goals at the national and international levels, promoting sustainable ways to do business and limiting the over-extraction of natural resources by reducing, reusing or recycling of plastic waste. To combat the issues and challenges of plastic waste, Government of NCT of Delhi has prepared a policy and action plan to manage the plastic waste in more efficient and sustainable manner. Delhi Government has also prepared a guideline to reduce the per capita consumption and generation of plastic and its waste through phasing out the nineteen SUP items, as prescribed in the PWM (Amendment) Rules, 2022.

Plastic waste management rules have fixed roles and responsibilities of different stakeholders to conserve and protect the environment. I compliment Delhi Pollution Control Committee, Government of NCT of Delhi and Indian Pollution Control Association, a Delhi based NGO for developing this comprehensive handbook for industries on plastic waste management rules, guidelines and policies. This handbook intends to bridge the knowledge gap among the industries and facilitate them to fulfil their responsibilities. I believe that this handbook will certainly support all relevant stakeholders in informing themselves about the efficient ways to deal with plastic waste and work in compliance with the rules.

Last but not the least, I would like to convey my best wishes to the readers of this handbook, especially industrialists and all the stakeholders in plastic waste management, who will support the Delhi Government and its department in making Delhi most suitable place for industrial growth.

Gopal Rai
Minister of Environment & Forest
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Acknowledgements

This handbook entitled **"A Handbook for Enforcement Personnel on Plastic Waste Management"** is a result of contribution of many people who are directly or indirectly associated with the implementation/ execution of plastic waste management rules in Delhi and in the development of this handbook. With this note, let me take the opportunity to thank each one of them for their efforts, dedication and support.

First and foremost, I would like to show gratitude to the Ministry of Environment, Forests and Climate Change for notifying the rules on plastic waste. I am also grateful to the Central Pollution Control Board for issuing guidelines to facilitate implementation of the rules by different stakeholders and developing centralised online portal for registration. I am also thankful to the industries associated with the production and consumption of plastic and managing their waste in a responsible manner.

I would like to congratulate and appreciate the entire team of Delhi Pollution Control Committee, especially officers of Consent Management Cell V, for their efforts in the implementation of Plastic Waste Management Rules on ground. Special thanks to Mohd Arif, Senior Environment Engineer, DPCC for his undying enthusiasm and determination in ensuring adherence to the rules. His contribution in developing this guidebook to educate industries in fulfilling their EPR mandates and other responsibilities is commendable.

Last but not the least, I would also like to acknowledge the support provided by Indian Pollution Control Association, especially Mr Ashish Jain, Mr Ajay Garg, Ms Garima Kaushik and Ms Deepanshi Gandherva for their contribution in compiling the document. I am thankful for their time and efforts.

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Introduction

This handbook is an effort to help industries working in the domain of plastic and plastic packaging in grasping the essence of Plastic Waste Management (Amendment) Rules, 2022. The rules clearly specify the mandates, roles and responsibilities of different stakeholders, including industries. The recently amended rules have laid emphasis on the development of new alternatives to plastics and provide a roadmap for businesses to move towards sustainable plastic packaging. The guidelines also provide a framework to strengthen the circular economy of plastic packaging waste.

The handbook consists of six sections, beginning with the understanding of plastic as a raw material. The second section focuses on plastic waste and the problems that it causes for all forms of life. The section specifically highlights the status of plastic waste in Delhi and the urgency to manage it sustainably.

The third section gives an introduction to the Plastic Waste Management (Amendment) Rules, 2022. It explains the evolution of the current rules and its salient features. Important definitions mentioned in the rules which are relevant for the industry are also presented in this section. In addition to this, different stakeholders involved in the generation and management of plastic waste are identified along with their roles and responsibilities. The next section elaborates on the Extended Producer Responsibility (EPR) mandates of Producers, Importers and Brand Owners. It provides a comprehensive framework that can be used by them in fulfilling their EPR obligations.

Section five of the handbook discusses another important concept stressed upon in the rules- Single Use Plastic (SUP). Recent rules have mandated the phasing out and banning of some SUP items. The comprehensive action plan prepared by Delhi Pollution Control Committee steps to ease the phasing out of SUP items from Delhi has also been discussed in this section. The last section of the handbook puts forward some recommendations for effective implementation of the plastic waste management rules in India.

Abbreviations

BMTs	Billion Metric Tonnes
CAP	Comprehensive Action Plan
CPCB	Central Pollution Control Board
CSR	Corporate Social Responsibility
DC	District Collector
DM	District Magistrate
DPCC	Delhi Pollution Control Committee
EC	Environmental Compensation
EPR	Extended Producers Responsibility
FRC	Fiber Reinforced Concrete
FY	Financial Year
GDP	Gross Domestic Product
GNCTD	Government of National Capital Territory, Delhi
HDPE	High Density Polyethylene
IEC	Information Education and Communication
LDPE	Low Density Polyethylene
MCD	Municipal Corporation of Delhi
MLP	Multi-layered Packaging
MOEF&CC	Ministry of Environment, Forests and Climate Change
MSME	Micro Medium and Small Enterprise
MSW	Municipal Solid Waste
MT	Metric Tonnes
NCT	National Capital Territory
PCC	Pollution Control Committee
PET	Polyethylene Terephalate
PIBOs	Producers, Importers and Brand Owners
PP	Polypropylene
PPT	Plasma Pyrolysis Technology
PRO	Producers Responsibility Organization
PS	Polystyrene Resins
PSU	Public Sector Undertaking
PVC	Poly Vinyl Chloride
PWM	Plastic Waste Management

Abbreviations

PWP	Plastic Waste Processors
RDF	Refused Derived Fuel
SMC	Sheet Moulding Compound
SOP	Standard Operating Procedure
SPCB	State Pollution Control Board
STF	Special Task Force
SUP	Single Use Plastic
TPA	Tonnes Per Annum
TPD	Tonnes Per Day
UD	Urban Development
ULB	Urban Local Body
UT	Union Territory
w.e.f.	With Effect From
w.r.t.	With Respect To
WMA	Waste Management Agencies

Section I: About Plastic

What is Plastic?

The word "Plastic" comes from the Greek word "plastikos" which means "to mould". Compounds comprising hydrogen and carbon (hydrocarbon) are found in fossil fuels and serve as building blocks for long polymer molecules. Monomers are the building units that connect together to produce polymers, which are long carbon chains. In simpler terms, plastic is defined as a material that contains as an essential ingredient an organic substance of large molecular weight. It is also defined as polymers of long carbon chains.

As per Plastic Waste Management (Amendment) Rules, 2022, plastic is defined as material which contains as an essential ingredient a high polymer such as polyethylene terephthalate, high density polyethylene, vinyl, low density polyethylene, polypropylene, polystyrene resins, multi-materials like acrylonitrile butadiene styrene, polyphenylene oxide, polycarbonate, Polybutylene terephthalate.

Types of Plastic

Plastic can be divided into two major types: thermoplastic and thermosets.

Table 1: Types of Plastic

Thermoplastic	Thermosetting Plastic
➲ This type of plastic does not change chemically (in terms of chemical composition or structure) when exposed to high temperatures. They can be remoulded in a soft state several times. ➲ Polystyrene, Polyethylene Teflon, Acrylic, Nylon, and other materials are examples. 	➲ This type of plastic can only be formed once and does not change shape or soften when heated. When exposed to a considerable amount of heat, these plastic degrade and get damaged. They are also called thermosets. ➲ Vulcanized rubber, Bakelite, Polyurethane, Epoxy resin, Vinylester-resin, and other materials are examples. 

Categories of Plastic

Different types of plastic possess different characteristics. Some are reusable, while others can be used only once. Some develop dangerous waste after multiple usages. Some are easily recyclable, while others require more complex and delicate processing method for recycling. Keeping the recyclability of plastic in mind, plastic are categorized into 7 groups having separate Resin Identification Code (RIC). The following table shows different categories of plastic that we see in our day to day lives:

Table 2: Categories of Plastic

Category No.	Name of plastic	Examples
1	Polyethylene Terephalate (PET), (Bottles carry bags, recycling bins, base cups).	
2	High Density Polyethylene (HDPE), (Various containers, dispensing bottles, wash bottles).	
3	Poly Vinyl Chloride (PVC), (Pipes, hoses, sheets, wire cables insulation, multilayer tubes, window profile fencing, lawn chairs).	
4	Low Density Polyethylene. (LDPE), (Mill pouches, plastic bags, water bottles, soft drink bottles, food jars, plastic films sheets, furniture carpets, panelling).	
5	Polypropylene (PP), (Disposable cups, bottle caps, straws, auto parts, industrial fibres).	
6	Polystyrene Resins (PS), (Disposable cups glasses, plates, spoon, trays, CD covers, cassette boxes, foams).	
7	Multi-materials like Acrylonitrile butadiene styrene, poly-phenylene oxide, poly-carbonate, Poly-butylene terephthalate, (Thermoset plastic, multilayer and laminates, nylon SMC, FRP, DC, melamine plates, helmets, shoe soles.	

This code (1-7) has to be mentioned on every plastic product manufactured for any purpose. In case more than one category of plastic is used in a product and/or its packaging, the codes of respective categories should be mentioned. The code denotes the category of plastic used to produce the product and its packaging and helps in channelizing the waste to its respective recycling/ processing facility once discarded.

Plastic is not only enduring, lightweight, and available at low prices, but also has very good thermal and electrical insulation properties. The versatile properties of various plastic polymers being water-resistant, non-porous, ductile and malleable make them suitable for manufacturing a wide range of products that also bring medical and technological advances in our modern society. Today, plastic is present in almost everything, from currency to electronic appliances, and it is used across multiple sectors, including packaging, building, construction, transportation, industrial machinery and health among others.

Section II: Plastic Waste

What is Plastic Waste?

As per PWM (Amendment) Rules 2022, plastic waste means any plastic discarded after use or after their intended use is over.
Plastic waste can be defined in different ways:

a. **On the basis of source**:
Plastic waste can be classified into two categories on the basis of its source of generation:

i. **Pre-consumer plastic waste:** Plastic waste generated in the form of rejects or discard at the stage of manufacturing of plastic products before the plastic reaches the end-use consumer.

ii. **Post-consumer plastic waste:** Plastic waste generated by the end-use consumer after the intended use of product is completed and is no longer being used for its intended purpose.

b. **On the basis of use**:

i. **Single use:** Plastic product or packaging which can be used only once before its disposal is known as Single Use Plastic (e.g. milk pouch, cutlery, cup, glass, ear bud, candy stick etc.).

ii. **Reusable**: Plastic Product or packaging which can be used more than one time before its disposal is known as reusable plastic (Bottles, containers, etc.).

Sources of Plastic Waste

There may be different sources of plastic waste generation like domestic (household), commercial, educational institutions, hospitality sector, hospitals, e-commerce industry, ships, cargo, industrial, etc.

Figure 1: Sources of Plastic Waste

Status of Plastic Waste in India

According to CPCB Annual Report on implementation of PWM Rules, 2016, the estimated plastic waste generated in India for the fiscal year 2019-20 is more than 34 lakhs TPA which roughly translates to 9300 TPD (data collected from 35 SPCB/PCC). According to a report on PWM released by Ministry of Housing and Urban Affairs, the global average of per capita consumption of plastic is 28 kg and India has a per capita capita plastic consumption of 11 kg.

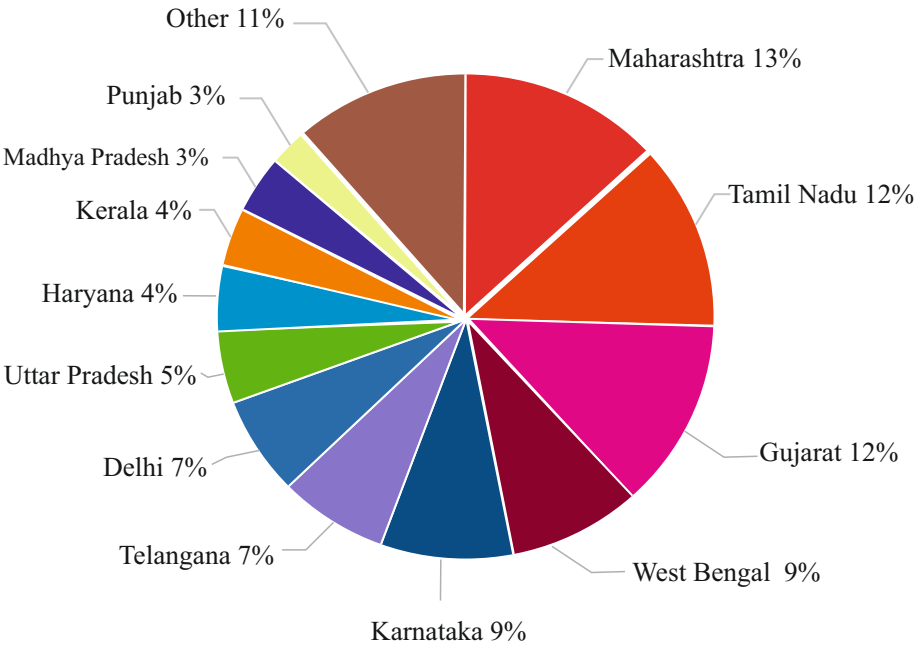


Figure 2: State/UT wise Plastic Waste Generation

Table 3: Status of Plastic Waste in Delhi

Estimated Quantity of Plastic Waste Generated in Delhi	Approximately 2,30,525 TPA (approx. 632 TPD).
Per Capita Plastic Waste Generation in Delhi	13.5 kg per capita per year.
Plastic Waste (Single Use Plastic)	5.6% of total solid waste (i.e. 50% of total plastic waste=316TPD).
Plastic Collection and Recycling Rate	80% (LDPE, PET, PVC, HDPE, PP, PS).
Recyclable Plastic composition in waste	Recyclable Plastic composition in waste.
Non-Recyclable Plastic Composition in waste	20% (Alkyds, Epoxy, Non-Recyclable Ester, Melamine formaldehyde, Polyurethane, Urea formaldehyde, Phenol formaldehyde, Silicons).
Causes of threat	● Non-biodegradable in nature. ● Non segregation. ● Littering, burning and dumping at landfill. ● Dumping at water bodies and threat to birds and animals.

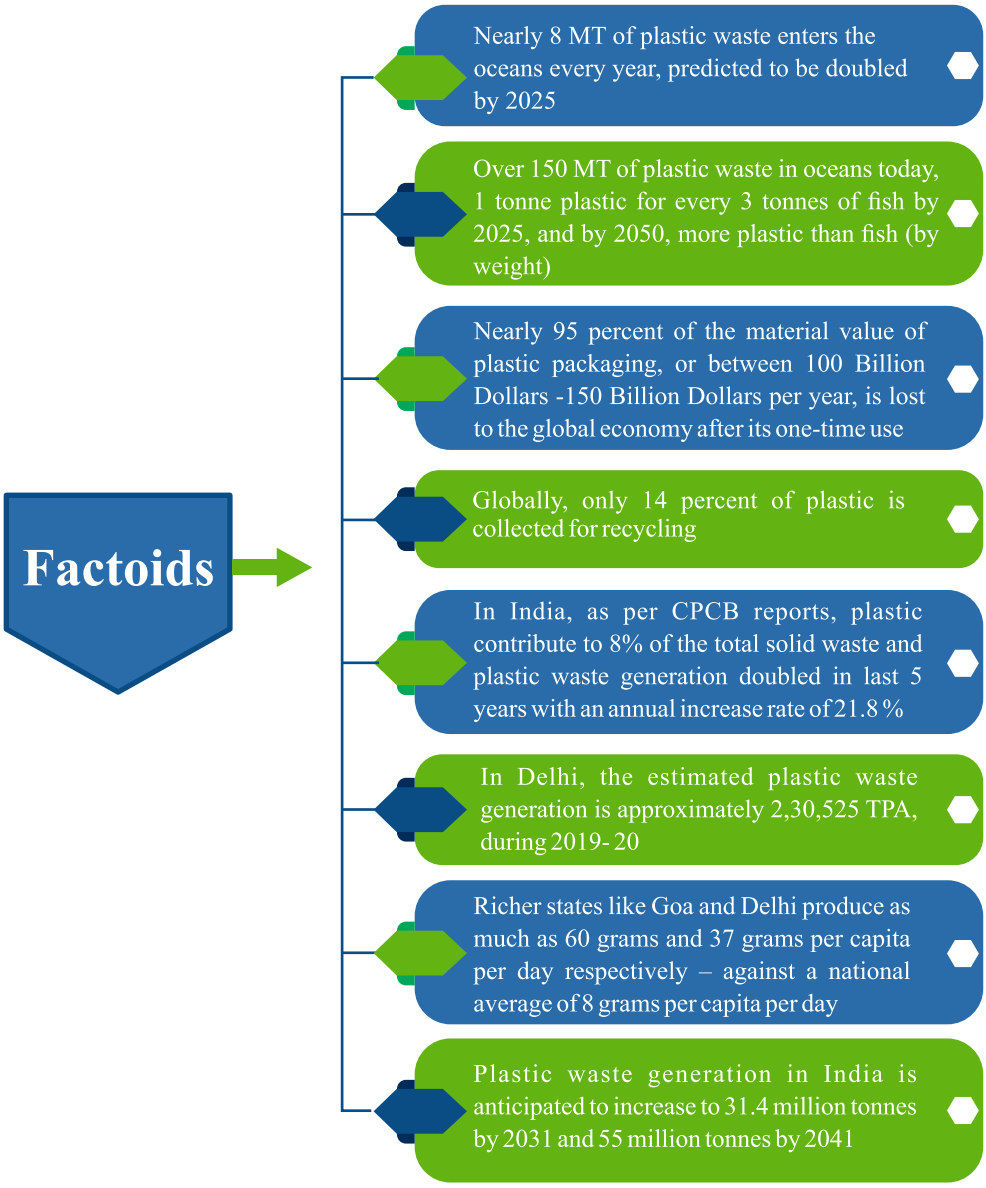


Figure 3: Factoids on Plastic Waste

Pollution Caused due to Plastic Waste

The plastic do not biodegrade but rather photo degrade, which means they gradually disintegrate into minute bits known as microplastics. These microplastics, if absorbed into our bodies, can cause severe health problems. Illicit burning of plastic waste leads to air pollution, which is another problem at hand. Whenever plastic waste is burned openly, it leads to air pollution and in several cases plastic is burned for cooking and heating, that causing serious health issues. Plastic is thought to take thousands of years to disintegrate, contaminating soil and water and posing risks to land, water, and wildlife. In some situations, the presence of plastic in water or food results in the presence of plastic in the human body, causing health problems. Plastic litter is unsightly and has the potential to harm the GDP of tourism-dependent countries. Plastic contamination in the waters has a financial impact on the tourism, shipping, and fishing industries. It is estimated that there is an annual economic loss of $13 billion due to pollution caused by plastic waste in marine ecology.

Challenges in Managing Plastic Waste

Plastic waste is the accumulation of plastic objects that are discarded after their usage in the Earth's environment that adversely affects wildlife, wildlife habitat, and humans. It also refers to the significant amount of plastic that isn't recycled and ends up in landfill, or thrown into unregulated dump sites. Plastic waste thrown in landfills infiltrates into the ground and adjacent water bodies, polluting the land & water, and eventually making its way into the food chain. Air pollution is also complemented by the uncontrolled burning of waste, notably plastic. As plastic does not break down naturally, it pollute natural systems, including rivers and oceans. Poorly disposed plastic waste poses the biggest challenge in its management. The production, use and disposal of plastic also create significant greenhouse gas emissions throughout the different stages of the plastic value chain. Littered waste is distinct from inadequately disposed' waste in that it represents plastic that is dumped or disposed-of without consent in an inappropriate location. Some challenges in plastic waste management are:

- People attitude toward waste management (social behavior).
- Lack of source segregation of waste.
- Inefficient door-to-door collection system of waste.

- Lack of knowledge on recycling properties of the waste commodities.
- Lack of infrastructure for recycling and processing of plastic waste.
- High logistic cost involved in collection, storage and transportation of light weight waste.
- High rate of contamination on post-consumer plastic waste, which again adds more cost for the recyclers.
- Recycling of plastic is an undaunted challenge and task as there are about 10-12 main polymer types and thousands of different resin grades and blends available for commercial applications.
- In addition to this, polymers have become increasingly multi-component through the use of multi-layers, laminates and composites.
- Furthermore, many polymers are rarely additive free. Normally they contain additives, formulates and modifiers such as fillers, pigments, antioxidants and flame- retardant, which can further interfere with the recycling process.

Sustainable Approach to Manage Plastic Waste

The lack of sustainable plastic waste management poses a serious threat to our environment and natural ecosystem globally. Data indicates that while a large quantum of plastic waste is generated, low levels of it are sustainably managed and discarded worldwide. From 1950 to 2015, around 8.3 Billion Metric Tonnes (BMTs) of plastic was produced globally, and of this, 80% (6.3 BMTs) was accounted as plastic waste. Of these 6.3 BMTS of waste, only 9% was recycled, 12% incinerated and 79% dumped into landfills, oceans or water bodies. There are two primary ways to manage plastic waste. The first is recycling or re-processing different categories of plastic waste into secondary material. The second is the incineration of plastic waste. However, incineration is expensive and cause pollution if not done using the right equipment. For any sustainable waste management system, the approach should be to reduce the generation of waste with maximum recovery of waste and least disposal at the landfill.

Reduce (Lowering the amount of waste produced)
Reuse (Using materials repeatedly)
Recycle (Using material to make new products)
Recovery (Recovering energy from waste)
Landfill (Safe disposal of waste to landfill)

Most Favoured option

Least Favoured option

Type of Recycling

Based on the process involved and nature of properties of end products, recycling can be classified into following:

(a) **Primary Recycling:** When properties of end products are similar to the original product. e.g. granules and moulding.
(b) **Secondary Recycling:** When there is an alteration of applications from raw material to end products. e.g. PET to yarn.
(c) **Tertiary Recycling**: When there is an alteration of chemical structure from raw material to end product and process involved production of basic chemical/ fuel. e.g. waste to oil.
(d) **Quaternary Recycling**: When the plastic waste is non-recyclable but having high calorific value and incinerate in control environment to use as alternate source of energy. e.g. co-processing in cement kiln and Waste to Energy.

Recycling Type can also be categories on the basis of process involved in recycling.

Mechanical Recycling: Mechanical recycling involves processing of waste into a product in which the characteristics of recycled product is similar to those of original product. The process involved in mechanical recycling is as follows:

Step 1: Collection and Segregation: To recycle any plastic waste, it has to be collected from the source of its generation like household, market, institute, industries etc. and that is the most challenging component of the entire process. In our country, municipalities and informal sector are involved in collection of waste from the source through door-to-door collection. The waste workers involved in collection do the primary and secondary segregation of waste into different categories and channelize to recyclers through well-established supply chain of scrap dealers and aggregators.

Step 2: Cleaning, Drying and Sizing: Since, there is lack of source segregation and waste generators put all kinds of waste in a single bin or garbage bag, the contamination rate in post-consumer plastic waste is very high and it cannot be processed or recycled directly. The post-consumer plastic waste requires proper cleaning and drying. The cleaned and dry plastic waste is then shredded into the required particle size of the recycling equipment placed in the particular industry.

Step 3: Extrusion: The dried flakes are fed into an extruder where they are heated to melting state and forced through the die, converting into a continuous polymer product of strands.

Step 4: Pelletizing: The strands are cooled by water and cut into pellets, which produces reprocessed granules.

Step 5: Fabrication into end product: Reprocessed granules are used as raw materials for producing end products.

Chemical Recycling: Chemical recycling is a process, in which a plastic or polymer is broken down into its basic components/constituents i.e. Monomer. This process is called de-polymerization. The monomers may be used as raw materials for manufacturing a new polymer. The types of chemical recycling processes are pyrolysis, hydrogenation (the breaking down of plastic into their constituent raw materials by hydrolysis is of course, possible if the plastic contains that groups which can be hydrolysed), incineration, and gasification.

Conceptual Framework of Circular Economy

Since the second industrial revolution, our economy has been linear, working on take-make-use-dispose' principles. On one hand, this has resulted in increased economic benefits and prosperity, but on the other hand, it has also led to the overuse of resources by promoting a 'use-and-throw' approach. According to the Circular Gap Report 2021, 100 billion tonnes of different materials enter the earth every year.

This model not only leads to environment degradation and resource depletion, but it also increases the cost of products by disturbing the 12 material supply system. This results from fluctuating prices of raw material, low materials availability, geopolitical dependence on different materials and increasing demand.

To address this issue, there is a need to focus on resource efficiency by adopting a circular economy. The circular economy is defined as an alternative to the linear 'take-make-waste' approach. It seeks to redesign waste, regenerate natural ecosystem and keep materials and products in use for as long as possible. To this end, resources are not consumed and discarded; destroying their value is retained by reusing, repairing, re-manufacturing or recycling. The circular economy entails new business models, strategies and innovations focusing on the optimization of processes and products. Adopting a circular economy results in extended life of products and assets by recycled/upcycled end-of-life products and closing the loop.

Enablers to Circular Economy in India

In the Indian context, a circular economy can play a significant role in achieving environmental goals at the national and international level, promoting sustainable ways to do business and limiting the over-extraction of natural resources.

The Indian Government has taken steps to mandate Extended Producers' Responsibility (EPR) under the Plastic Waste Management Rule 2016. EPR incorporates circularity by making producers responsible for the collection and processing of a product till the end of its life. Organizations and industries are partnering with government stakeholders to implement integrated models focusing on circular economy. In addition, to support the circular economy, emphasis has been laid on drafting policies and missions such as the Swachh Bharat Mission and Solid Waste Management Rule 2016, which focus on recycling resources.

For economies across the globe, adopting a circular economy can help in achieving various Sustainable Development Goals (SDGs) directly or indirectly.

Section III: Plastic Waste Management Rules, 2016

Background

The Ministry of Environment, Forests and Climate Change (MoEF&CC), Government of India notified the **Plastic Waste Management Rules, 2016,** as one comprehensive rule that encompasses all the amendments since the first rules were released for PWM in India in 1999 (Recycled Plastic Manufacturing and Usage Rules 1999). The 2016 rules replaced the earlier Plastic Waste (Management and Handling) Rules 2011. In 2018, an amendment was brought about to this rule. Other amendments to the Plastic Waste Management Rules 2016 were brought about in August 2021, September 2021 and February 2022. Now the rule is called as **Plastic Waste Management (Amendment) Rules, 2022**.

The new rules reflected a paradigm shift to regard waste as a wealth and resource for circular economy. It aims for a more efficient regulatory framework for the management of plastic waste generated in the country. At the same time, it will give thrust to plastic waste minimization, source segregation, recycling, involving waste pickers, recyclers and waste processors in the collection of the plastic waste fraction either from households or any other source of its generation or intermediate material recovery facility, and adopt polluters pay principle for the sustainability of the waste management system.

As compared to the **Plastic Waste (Management and Handling) Rules 2011,** which were applicable only to the municipal areas, the jurisdiction under the 2016 rules, as amended from time to time, extends beyond the municipal areas to include outgrowths in urban agglomerations and rural areas. These Rules apply to every waste generator, local body, gram panchayat, manufacturer, importer, producer and brand owner**.**

Plastic Waste Management Rules, 2016 (Amended till date)

The latest rules for managing plastic waste are known as the Plastic Waste Management (Amendment) Rules, 2022. These rules provide the guidelines and framework for implementation of EPR. The guidelines provide the roles and responsibilities of Producers, Importers, Brand Owners, Central Pollution Control Board, State Pollution Control Board or Pollution Control Committees, re-cyclers and

waste processors for effective implementation of Extended Producer Responsibility. These Rules also provide conditions for the manufacture, sale and use of carry bags, plastic sheets and multilayered packaging. The sachets using plastic material shall not be used for storing, packing or selling *gutkha*, tobacco or pan masala.

Timeline of Plastic Waste Management (PWM) Rules

The trajectory of evolution of the rules has been mentioned below:

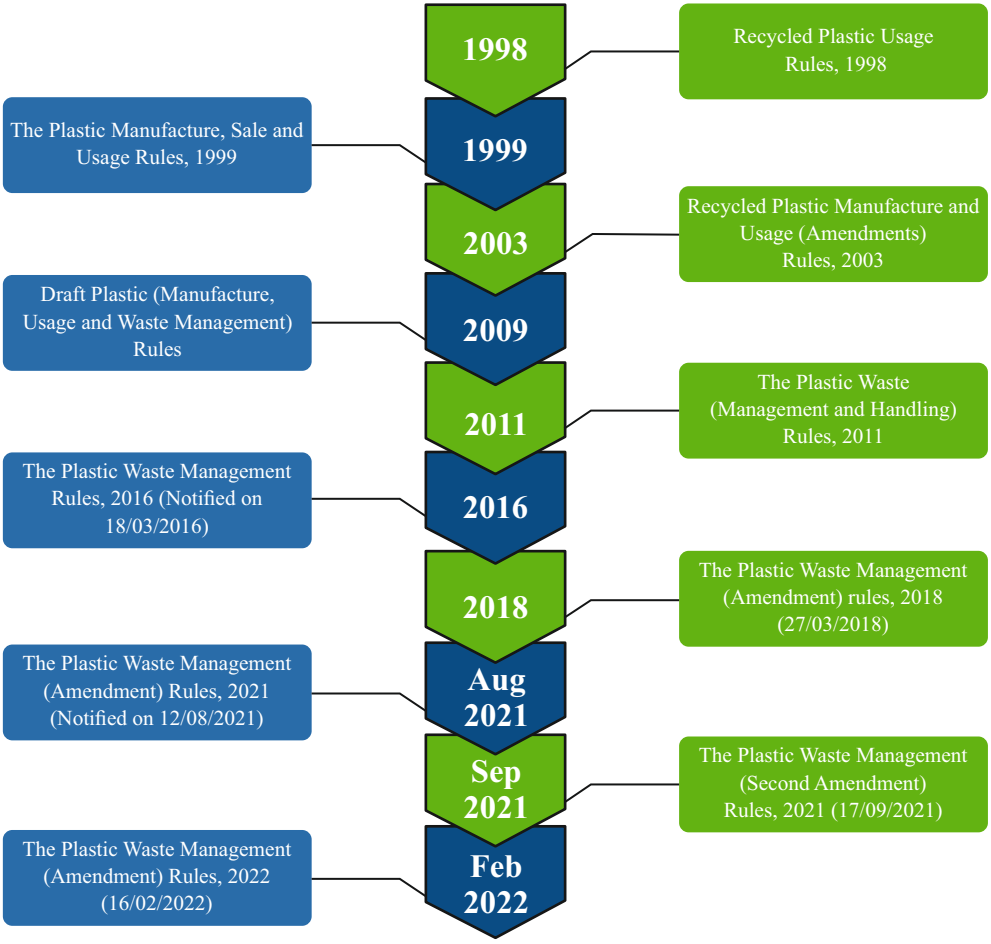


Figure 4: Time Line of Plastic Waste Management Rules in India

Key Definitions

- **Biodegradable Plastic:** Plastic, other than compostable plastic, which undergoes complete degradation by biological processes under ambient environment (terrestrial or in water) conditions, in specified time periods, without leaving any micro plastic, or visible, distinguishable or toxic residue, which have adverse environment impacts, adhering to laid down standards of Bureau of Indian Standards and certified by Central Pollution Control Board.
- **Brand Owner:** A person or company who sells any commodity under a registered brand label.
- **Carry Bags:** (covered under Category II of plastic packaging – Clause (5.1) (II)) means bags made from plastic material or compostable plastic material, used for the purpose of carrying or dispensing commodities which have a self-carrying feature but do not include bags that constitute or form an integral part of the packaging in which goods are sealed prior to use.
- **End of Life Disposal:** Means using plastic waste for generation of energy and includes co-processing (e.g. in cement kilns) or waste to oil or for road construction as per Indian Road Congress guidelines, etc.
- **Extended Producer Responsibility:** Means the responsibility of a producer for the environmentally sound management of the product until the end of its life.
- **Importer:** A person who imports or intends to import and holds an Importer - Exporter Code number, unless otherwise specifically exempted.
- **Institutional Waste Generator:** Includes occupier of the institutional buildings such as building occupied by Central Government Departments, State Government Departments, public or private sector companies, hospitals, schools, colleges, universities or other places of education, organisation, academy, hotels, restaurants, malls and shopping complexes.
- **Manufacturer**: It includes a person or unit or agency engaged in production of plastic raw material to be used as raw material by the producer.
- **Multi-layered Packaging:** Any material used or to be used for packaging and having at least one layer of plastic as the main ingredients in combination with one or more layers of materials such as paper, paper board, polymeric materials, metalized layers or aluminium foil, either in the form of a laminate or co-extruded structure.

- **Plastic:** Material which contains as an essential ingredient a high polymer such as polyethylene terephthalate, high density polyethylene, Vinyl, low density polyethylene, polypropylene, polystyrene resins, multi-materials like acrylonitrile butadiene styrene, polyphenylene oxide, polycarbonate, Polybutylene terephthalate.
- **Plastic Waste:** Any plastic discarded after use or after their intended use is over
- **Plastic Packaging:** Means packaging material made by using plastic for protecting, preserving, storing and transporting of products in a variety of ways.
- **Plastic Sheet:** Means plastic sheet is the sheet made of plastic.
- **Plastic Waste Processors**: Means recyclers and entities engaged in using plastic waste for energy (waste to energy), and converting it to oil (waste to oil), industrial composting.
- **Pre-consumer Plastic Packaging Waste:** 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.
- **Post-consumer Plastic Packaging Waste:** 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.
- **Producer:** Persons engaged in manufacture or import of carry bags or multi-layered packaging or plastic sheets or like, and includes industries or individuals using plastic sheets or like or covers made of plastic sheets or multi-layered packaging for packaging or wrapping the commodity.
- **Recyclers:** Entities who are engaged in the process of recycling of plastic waste;
- **Recycling:** Means the process of transforming segregated plastic waste into a new product or raw material for producing new products.
- **Registration:** Means registration with the State Pollution Control Board or Pollution Control Committee concerned as the case may be.
- **Reuse:** Means using an object or resource material again for either the same purpose or another purpose without changing the object's structure.
- **Single-use plastic commodity:** Plastic item intended to be used once for the same purpose before being disposed of or recycled .

- **Use of Recycled Plastic:** Means recycled plastic, instead of virgin plastic, is used as raw material in the manufacturing process;
- **Waste Management:** Means the collection, storage, transportation reduction, reuse, recovery, recycling, composting or disposal of plastic waste in an environmentally sound manner.
- **Waste to Energy:** Means using plastic waste for generation of energy and includes co-processing (e.g. in cement kilns).

Salient Features of the PWM Rules

The Plastic Waste Management (Amendment) Rules of 2022 provide the sharpest measures taken against the consumption of plastic packaging in India. The most significant feature of these rules is that the Producers, Importers, and Brand Owners (PIBOs) that produce/use plastic packaging are legally bound to follow the system of collecting back the plastic packaging introduced by them/ through their products under the Extended Producer Responsibility (EPR).

- These rules shall apply to every waste generator, local body, gram panchayat, retailers, street vendors, manufacturer, importer, brand owners, producers, recyclers/ waste processors, CPCB, and SPCB/PCC.
- It introduces the EPR mandates for PIBOs and fixes their responsibility to develop collect back system for the equivalent quantity of plastic packaging waste introduced by them/ their products into the Indian market.
- It introduces the registration mandates for the PIBOs and plastic waste processors (plastic recyclers, waste to energy, waste to oil, and industrial composting) through the centralized online portal developed and maintained by CPCB (**www.cpcbeprplastic.in**).
- The PIBOs and plastic waste processors shall not carry out any business without registration under PWM Rules.
- These rules encourages the recycling, alternate use and energy recovery of plastic waste vis-a-vis waste to energy, waste to oil and cement kilns, gasification and for road construction.

- Important conditions for the manufacture, import, stocking, distribution, sale and use of carry bags, plastic sheets or like, or cover made of plastic sheet and multi-layered packaging have also been introduced which are as follows:

    i. Carry bags made of virgin or recycled plastic, shall not be less than seventy five microns in thickness; w.e.f 30th September, 2021 and 120 microns w.e.f. 31st December, 2022.
    ii. Plastic sheet or like, which is not an integral part of multi-layered packaging and cover made of plastic sheet used for packaging, wrapping the commodity shall not be less than fifty microns in thickness except where the thickness of such plastic sheets impair the functionality of the product.
    iii. The manufacturer shall not sell or provide or arrange plastic to be used as raw material to a producer, not having valid registration from the concerned SPCBs or PCCs.
    iv. Sachets using plastic material shall not be used for storing, packing or selling *gutkha*, tobacco and pan masala.
    v. Non-woven plastic carry bag shall not be less than 60 Gram Per Square Meter (GSM) with effect from the 30th September, 2021.
    vi. Manufacture and use of multi-layered plastic packaging which is non-recyclable or non-energy recoverable or with no alternate use, if any, should be phased out.
    vii. The provision of thickness shall not be applicable to carry bags made up of compostable bags and commodities and shall conform to the IS 17088:2008 titled as specifications for compostable plastic and shall obtain certificate from CPCB.

- As per amendment vide notification dated 17th September, 2021, carry bags or products made of recycled plastic can be used for storing, carrying, dispensing, or packaging ready to eat or drink food stuff, subject to standards and regulations under the Food Safety and Standards Act.

- The Plastic Waste Management by the urban local bodies in their respective jurisdiction shall be as under plastic waste, which can be recycled, shall he channelized to authorised plastic waste recycler and recycling of plastic shall conform to the Indian Standard: IS 14534:1998 titled as Guidelines for Recycling of Plastic, as amended from time to time.
- Thermo set plastic waste shall be processed and disposed of as per the guidelines issued from time to time by the Central Pollution Control Board; and the inert from recycling or processing facilities of plastic waste shall be disposed of in compliance with the Solid Waste Management Rules, 2016 or as amended from time to time.
- The Government of NCT of Delhi shall constitute State Level Advisory Committee headed by Secretary, Urban Development Department for the purpose of effective monitoring of implementation of these Rules.
- Marking or labelling- Each plastic carry bag, plastic packaging and multi-layered packaging shall have the following information printed in English namely:- Name and registration number of the producers.
- Thickness of plastic packaging in case of carry bag.
- Type of plastic category used (as mentioned in Table 2: Categories of Plastic) Name and certificate number, in case of carry bags made from compostable plastic.
- Each recycled carry bag shall bear a label or a mark recycled' and shall conform to the Indian Standard: IS 14534:1998.
- Each carry bag made from compostable plastic shall bear a label and shall conform to Indian Standard ISO 17088:2008.

Stakeholder Mapping

There are key stakeholders, who are very important with respect to effective implementation of PWM Rules at ground level. The table mentioned below briefly explains the roles and responsibilities of different stakeholders:

Table 4: Stakeholder Mapping

Stakeholders of EPR	Definition	Responsibilities
Central Pollution Control Board	Nodal agency for setting up guidelines and standards related to waste management, and coordination among key stakeholders.	• Formulation of guidelines & SOP for execution of EPR. • Development and maintenance of centralised online portal to facilitate PIBOs and PWPs for registration and submission of their annual report. • Holding stakeholder consultations. • Coordination with SPCBs/PCCs. • Data compilation.
State Pollution Control Board	State-level bodies for implementation of PWM Rules 2016 as amended time to time and monitoring the activities related to that.	• Shall constitute State Level Advisory Committee headed by Secretary, Urban Development Department (UDD). • Implementation of CPCB guidelines & SOPs related to EPR. • Verifying the action plans & annual reports submitted by the PIBOs & PWPs. • Establish regular dialogues with stakeholders. • Industry authorizations.

Stakeholders of EPR	Definition	Responsibilities
Producer	An entity engaged in the manufacture or production of plastic packaging material.	• Submit online application on CPCB portal for registration. • Set up a mechanism for collection of plastic waste forits recycling or end-of-life disposal. • Discontinue productionof Single Use Plastic(SUP) items as notified in PWM Rules dated12th August, 2021. • Submission ofannual report against its approved EPR action plan.
Brand Owner	An entity with registered trade mark that sell their products wrapped in plastic packaging.	• Submit online application on CPCB portal for registration. • Set up a mechanism for collection of plastic waste for its recycling or end of-life disposal. • Discontinue use of Single Use Plastic (SUP) items as notified in PWM Rule dated 12th August, 2021. • Submission of annual report against its approved EPR action plan.

Role of Central Pollution Control Board (CPCB)

- The CPCB shall register PIBOs, who are operating in more than two states, and PWPs, through online portal and may charge processing fee of applications for registration and an annual fee for processing of returns, as per prescribed procedure.
- In case, where PIBOs are operating in the jurisdiction of a SPCB/PCC, the CPCB as per guidelines so decided, will share the application fee with the concerned SPCB/PCC.
- The registration shall be done within two weeks from the submission of a complete application online by the PIBOs.
- CPCB by itself or through a designated agency shall verify compliance of PIBOs through inspection and periodic audit, as deemed appropriate.
- CPCB can also verify compliance of PWPs through inspection and periodic audit CPCB shall publish the list of PIBOs who have failed to meet EPR targets and obligations in the previous financial year, on an annual basis, by 30th September of the next financial year.
- CPCB will establish a mechanism to ensure a regular dialogue between relevant stakeholders involved in the fulfilment.

Role of State Pollution Control Board (SPCB) or Pollution Control Committee (PCC)

- The concerned SPCB or PCC shall register PIBOs (operating in one or two states) and PWPs, through the online portal developed by CPCB.
- SPCB or PCC shall bring out a list of entities (Exception Report) that have not fulfilled their EPR responsibilities on annual basis and publish the same on their website.
- SPCB or PCC shall submit the Annual Reports submitted by PIBOs & PWPs in their jurisdiction to CPCB and upload the same on the online EPR portal.
- SPCB or PCC will establish a mechanism to ensure a regular dialogue between relevant stakeholders involved in the fulfilment of EPR obligations under the PWM Rule, 2016.
- SPCB or PCC shall carry out a compositional survey of collected mixed municipal waste to determine the share of plastic waste as well as different categories of plastic packaging material on a half-yearly basis.

Role of Producer, Importer & Brand Owners (PIBOs)

- The PIBOs shall apply for Registration with the prescribed application and annual processing fees at centralize EPR Portal (**www.cpcbeprplastic.in)** developed & maintained by CPCB to fulfil their EPR compliances and comply with provisions under PWM Rule, 2016 as amended time to time.
- PIBOs shall provide details of pre-consumer & post-consumer plastic packaging waste generated in last two financial years as per categories classified in PWM Rule 2022 (Rigid, Flexible, MLP & Compostable) to calculate its EPR eligibility targets.
- Brand Owners shall provide details of plastic packaging purchased from registered and non-registered producers and/or importers separately.
- Producers shall provide detail of plastic packaging supplied to registered brand owner/importer and/or non-registered entity separately.
- PIBOs shall file annual returns on the plastic packaging waste collected and recycled/processed towards fulfilling obligations under EPR on centralised online portal developed and maintained by CPCB by 30th June of the next financial year.
- In case of non-compliance, action shall be taken against the defaulter units including closure of the unit, disconnection of electricity/ water supply including levying of Environmental Compensation.
- The existing registrations shall be aligned with the SOP within three months of issue of SOP (i.e. 30th June 2022) for which registered PIBOs shall resubmit the application online along with the relevant information and processing fee.

Role of Plastic Waste Processors (PWPs)

- All PWPs shall have to register with concerned SPCB or PCC.
- The PWPs shall submit annual returns after end of every financial year by 30th April of the next financial year on the quantity of plastic waste processed category-wise as per prescribed pro forma on the centralized portal developed by CPCB.
- The total quantity of plastic waste processed by plastic waste processors and attributed to Producers, Importers & Brand-Owners, on an annual basis, will be made available on the centralized portal developed by CPCB.
- Only PWPs registered under Plastic Waste Management Rules, 2016, as. amended from time to time, shall provide certificates for plastic waste processing, except in case of use of plastic waste in road construction. In case where plastic waste is used in road construction the Producers. Importers & Brand-Owners shall provide a self-declaration certificate in pro forma developed by CPCB. The pro forma for the certificate shall be developed by CPCB.
- The certificate for plastic packaging waste provided by registered PWPs shall be in the name of registered PIBOs or local authorities.
- The PWPs undertaking end-of-life disposal of plastic packaging waste viz. waste to energy, waste to oil, and cement kilns (co processing) shall provide information on an annual basis as per prescribed pro forma, on the centralized portal developed by CPCB.

Note: Standard Operating Procedure for registeration of PIBOs and PWPs through Plastic EPR Portal as per PWM Rules 2016 are also available on DPCC/CPCB website.

Section IV: Extended Producer Responsibility (EPR) Mechanism

As per rule 9 (1 & 2) of PWM Rules, 2016, as amended time to time, PIBOs are responsible to oblige Extended Producer Responsibility for environmentally sound management of the product until the end of its life. This means the PIBOs are responsible to develop and execute the collection back mechanism for the equivalent quantity of plastic waste packaging waste introduced directly or through sale of their products into the Indian market within six month from the date of notification of PWM Rules. As per MoEFCC notification dated 16th February, 2022, Schedule II on Guidelines on Extended Producer Responsibility for Plastic Packaging was inducted in PWM Rules, 2016.

Obligated Entities

As per the Rule 13 of PWM Rules, the following entities are required to get registered with CPCB (if operating in more than two States/UT) or with respective SPCB/PCC.

- Producer (P) of plastic packaging.
- Importer (I) of all imported plastic packaging and / or plastic packaging of imported products.
- Brand Owners (BO) including online platforms/marketplaces and supermarkets/retail chains other than those, which are micro and small enterprises as per the criteria of Ministry of Micro, Small and Medium Enterprises, Government of India.
- PWPs except in case of cement kilns & road construction.

Following are the standard steps to be followed by EPR obligated entities:

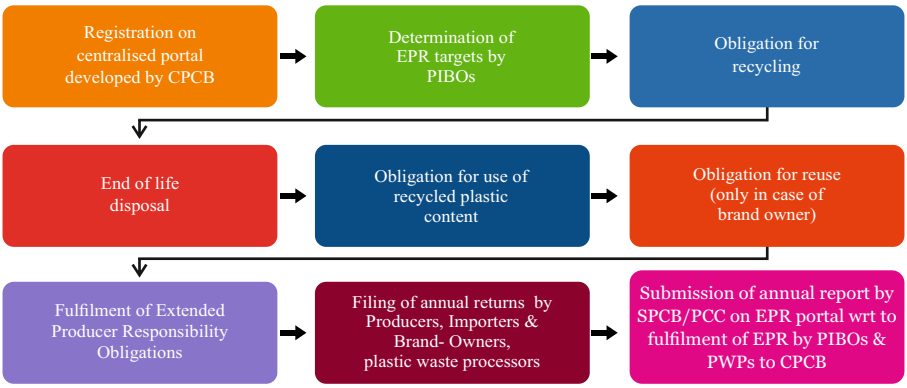


Figure 5: Standard steps to fulfil EPR obligation

Plastic Categories for EPR

PIBOs are responsible to quantify their pre-consumer and post-consumer plastic packaging waste and consumption respectively into the following prescribed categories to fulfil their EPR obligation:

Table 5: Plastic Categories for EPR

Category I	Rigid plastic packaging (e.g. packaging in the form of bottles and containers).
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.
Category III	Multi-layered plastic packaging (at least one layer of plastic and at least one layer of material other than plastic).
Category IV	Plastic sheet or like used for packaging as well as carry bags made of compostable plastic.

Extended Producer Responsibility Mechanism

PIBOs are responsible to develop a mechanism for implementing their EPR action plan. This means that PIBOs need to prepare a plan which involves Registration on centralised portal developed by CPCB Determination of EPR targets by PIBOs Obligation for recycling End of life disposal Obligation for use of recycled plastic content Obligation for reuse (only in case of brand owner) Fulfilment of Extended Producer Responsibility Obligations Filing of annual returns by Producers, Importers & Brand- Owners, plastic waste processors Submission of annual report by SPCB/PCC on EPR portal wrt to fulfilment of EPR by PIBOs & PWPs to CPCB 26 collection of data and information about its plastic packaging purchase, wastage at manufacturing or processing unit, and consumption of plastic packaging through sale along with detail of buyers, suppliers and clients (brand owner). All these data and information is required to calculate the EPR target and once target is estimated, it has to be executed in ground through the following approach:

a. Through own distribution channel.
b. Through Urban Local Bodies (ULBs).
c. Through engagement of Waste Management Agencies (WMA).
d. Through engagement with authorized PWPs, road construction contractor, and cement kiln.

It is important to note that EPR action plan may involve the following procedure for the treatment or processing of collected plastic waste through above mentioned approaches:

- **Reuse:** PIBOs may develop the mechanism for reuse of post-consumer plastic packaging to meet its EPR target.
- **Recycling:** PIBOs may channelize their collected plastic waste to the authorized PWPs for its recycling and get the EPR credit from the recyclers against the quantity supplied.
- **Use of recycled plastic content:** PIBOs may also fulfil their EPR liability by using recycled plastic content in plastic packaging produced/consumed by them. EPR target will compensate proportionally to the percentage of recycled content in packaging.
- **End of life disposal:** If PIBOs are using or collecting non-recyclable plastic packaging or waste then they may channelize their collected plastic waste to waste to energy / cement kiln / waste to oil / road construction to fulfil its EPR obligation.

Table 6: Formula for calculating EPR liability

Q: Eligible Quantity in MT
A: The average weight of plastic packaging material sold in the last two FYs
B: The average quantity of pre-consumer plastic waste generated in last two FYs
C: Quantity of plastic sold to Brand Owners in last FY
D: The average weight of plastic waste purchased/introduced in the last two FYs

For Producer	For Importer	For Brand Owner
Q= (A+ B) – C	Q= (A+ B) – C	Q= (D+ B)

Table 7: Extended Producer Responsibility target for PIBOs

	Year	Extended Producer Responsibility target (as a percentage of Q1 –category- wise)
I	2021 - 22	25 %
II	2022 - 23	70 %
III	2023 - 24	100%

Plastic Packaging Waste Collection System by PIBOs

While fulfilling EPR obligations, PIBOs may develop collection & segregation infrastructure of plastic packaging waste based on the category of plastic. It may include the following:

- Establishing waste plastic collection points and Material Recovery Facilities (MRFs).
- Ensuring collection of the plastic packaging waste from the collection points, with a frequency that is proportionate to the area covered and the volume.
- Offering the collection of plastic, from the entities like urban local bodies, gram panchayat, other public authorities or third parties carrying out waste management, and provide for the collection from all entities that have made use of that offer; provide for the necessary practical arrangements for collection and transport.
- Ensuring that the plastic packaging waste collected from the collection points are subsequently subject to recycling in a registered facility by a recycler or its permitted end use in the designated manner.
- PIBOs may ensure the network of collection points taking into account population size, expected volume of plastic or packaging waste, accessibility and vicinity to end users.
- The entities involved in waste collection will hand over the waste for treatment and recycling or for identified end uses.

Section V: Single Use Plastic

What is Single Use Plastic (SUP)?

According to PWM Rules, 2016, Single-use plastic commodity is defined as a plastic item intended to be used once for the same purpose before being disposed off or recycled. Recently in India, the policymakers have laid significant focus on single-use plastic while working on the Plastic Waste Management Rules. As a result, the Plastic Waste Management (Amendment) Rules, 2021 prohibited identified SUP items which have low utility and high littering potential by 2022. It notified that the manufacture, import, stocking, distribution, sale and use of following single-use plastic, including polystyrene and expanded polystyrene, commodities shall be prohibited with effect from the 1st July, 2022:

a. Ear buds with plastic sticks, plastic sticks for balloons, plastic flags, candy sticks, ice-cream sticks, polystyrene (Thermocol) for decoration.
b. Plates, cups, glasses, cutlery such as forks, spoons, knives, straw, trays, wrapping or packaging films around sweet boxes, invitation cards, and cigarette packets, plastic or PVC banners less than 100 micron, stirrers.

In order to stop littering due to light weight plastic carry bags, with effect from 30th September, 2021, the thickness of plastic carry bags has been increased from **fifty microns** to **seventy-five microns** and to **one hundred and twenty microns** w.e.f. 31st December, 2022. This will also allow reuse of plastic carry bags due to increase in thickness.

The rules also state that plastic packaging waste, which is not covered under the identified SUP items, shall be collected and managed in an environmentally sustainable way through the EPR of the PIBOs. For effective implementation of EPR, the Guidelines for Extended Producer Responsibility' have been given legal force through Plastic Waste Management (Amendment) Rules, 2022. The EPR policy approach assigns to producers financial and/or physical responsibility for the handling or disposal of post-consumer items. The responsibility of working out the modalities for the waste collection system based on EPR lies with the manufacturers, importers and users. Assigning such responsibility creates incentives to reduce waste at the source, encourage environmentally friendly product design, and support public recycling and waste management.

The guidelines released by the MoEFCC on management of SUP stress over the promotion of eco-friendly alternatives in order to phase them out progressively.

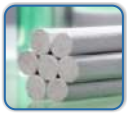
Action plan to phase out Single Use Plastic in Delhi

The following table shows the list of alternatives for 19 products identified as per notification dated 12th August, 2021 for prohibition under the Plastic Waste Management (Amendment) Rules, 2021.

Table 8: List of Single Use Plastic items to be prohibited w.e.f. 1st July, 2022 and their suggested alternatives

Single Use Plastic items	Suggested alternatives to Single Use Plastic items
Plastic sticks used in balloons, flags, candy, ice-cream and ear buds	1. Bamboo & other wooden sticks for ear buds, flags as per the guidelines of concerned authority. 2. Broom sticks/coconut sticks for flags, balloons, ear buds as per the guidelines of concerned authority. 3. Bamboo & Paper sticks for ice-creams & candies as per the guidelines of concerned authority. 
Thermacol that is used in decorations Items such as plates, cups, glasses	1. Decorations with flowers, cloth, papers, & other biodegradable material. 2. Glass, ceramic ware, earthenware, stainless-steel tableware for restaurants, *dhabas* hotels & other dining places as per the guidelines of concerned authority. 3. Earthenware for take away joints & other small-moving vendors. 4. *Bartan Bhandar'*: Renting out utensils for small/medium scales events. 5. Compostable disposables that are made from bagasse, bamboo, recycled paper, cornstarch, and fallen leaves. 

Cutlery such as forks, spoons, knives, straws, trays	1. Modification in the design of cartons, hence eliminating the need of straws. 2. Modification in the design of cartons where consumer will not be able to remove the straw after its utilization as it will be locked in it. It will control straw littering. 3. Paper, bamboo, stainless steel straws as per the guidelines of concerned authority. 4. Strict guidelines for brand owners to not release open straws in the market. 5. Complete ban on plastic coated plates, paper cups, bowls, plastic sheets used as table spread, plastic water pouches. 6. Bagasse, natural fibres, leaves for cutlery. 7. Edible cutlery made from grains, pulses, and millets.   
Wrapping and packing films used in sweet boxes	1. Cellophane, a polymeric cellulose film made from the cellulose from wood, cotton, hemp or other sources as per the guidelines of concerned authority. 2. Cellulose nano fiber, Butter paper/parchment paper, aluminum foil as per the guidelines of concerned authority. 3. Earthenware for sweets (will boost MSME), Banana leaf wrapping of Kulhads as per the guidelines of concerned authority.   

Wrapping and packing films around invitation cards	No alternative, should be completely banned.
Wrapping and packing films around cigarette packets	1. Cellophane/cellulose film as per the guidelines of concerned authority. 2. Recycled cardboard and paper. 3. Greenbutts is a natural, rapidly degrading cigarette filter using raw materials including flax, cotton, and manila hemp with no artificial compounds or chemical residues. 4. Use of aluminum sheet as per the guidelines of concerned authority. 5. Redesigning of cigarette box & utilizing plastic solely to make air tight boxes. 6. In the absence of any other alternative, increasing the thickness of Plastic coating on cigarette packets.  
Stirrers	Bamboo sticks, wooden sticks, stainless steel spoon, coconut sticks as per the guidelines of concerned authority.   
Plastic banners less than 100 microns in thickness	1. Cloth/fabric banner, canvas banner, paper banner 2. Eco banners that are PVC free and 100% recyclable as an alternative to traditional PVC Banners. 3. Either a complete ban on PVC banners irrespective of its thickness or removing the thickness clause as collection & recycling of PVC banner of any thickness can be done easily.  

Non-woven bags below 240 microns	1. Paper bags for light weight products. 2. Cloth bag for heavy products. 3. Jute bag for heavy products. 4. Reusable cotton bags or waste fabric bags. 5. Complete ban on non-woven bags irrespective of its thickness as they are not recyclable.   

Comprehensive Action Plan for Effective Compliance of PWM Rules

The Hon'ble Prime Minister reviewed the matter during the PRAGATI meeting held on 24th Feb, 2021 wherein it was informed that the monitoring mechanism shall be integrated with the Action Plan for phasing out SUPs.

The Special Task Force (STF) under the Chairmanship of Chief Secretary for taking measures to phase out SUPs and implementation of provisions of PWM Rules 2016 amended till date in a mission mode was constituted on 20th May, 2021. The first meeting of the STF was held on 8th June, 2021. It was decided that STF shall prepare a Comprehensive Action Plan (CAP) with focus on implementation of provisions of PWM Rules, 2016 and building strong public movement around the issue with wider public participation. The action points/responsibilities to be implemented in time bound manner by various agencies like ULBs, Environment Department, DPCC, Urban Development, Education Department etc. were decided in the STF meeting.

Subsequently, meetings of National Task Force were held on 31st August, 2021 and 4th April, 2022 wherein progress was discussed and follow up actions to be taken by States/ UTs, Central Ministries, MoEFCC and CPCB were decided.

Environment Department and DPCC on behalf of Delhi Govt. has prepared CAP for elimination of identified SUPs has been prepared on the guidelines of MoEFCC wherein various thematic area/activity described as short, medium and long term activity to be implemented by the Responsible Departments/Agencies of Government of Delhi in the given timeline. The Action Plan has been circulated on 24th August, 2021 to various departments/agencies for implementation by them on given action points in the prescribed timeline. Similarly, the Information, Education and Communication (IEC) plan has also been circulated on 23th August, 2021 to various departments/agencies for necessary action by them.

Promotion of Eco-friendly Alternatives

State/UT Governments can play a key role in promoting eco-friendly alternatives to phase out SUPs progressively. Projects which support upscaling or recycling of SUP items and promote small scale or micro enterprises should be encouraged.

Meetings for consultation with stakeholders for identification and adoption of feasible alternatives were held on 28th June, 2021 and 2nd August, 2021 and 29th October, 2021 by Environment Department to discuss and brainstorm about identification and adoption of feasible alternatives for identified SUP items. Online responses received from various stakeholders towards identification and adoption of feasible alternatives to identified SPUs, were considered while drafting the CAP for Delhi.

How to Ease the Phasing Out of Single Use Plastic?

- Formation of a help desk on e-platform. This help desk shall work as a reliable database which shall have all the necessary information about authorised recyclers, scrap-dealers, PROs, Single Use Plastic alternatives registered suppliers, importers, producers dealers, waste generators etc. This will be a common help desk-cum- solution providing platform.
- Local suppliers/vendors should be engaged in supply chain of single use items.
- Recognition & provision of incentives by regulatory authorities to brands who are adopting single use plastic alternatives.
- Launching of schemes to support the MSME sector for setting up facilities for sustainable packaging and SUP alternatives.

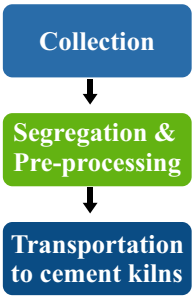
Section - VI Way Forward & Recommendations

Plastic waste has emerged as an issue in recent years, necessitating the development of new models for long-term management of plastic waste. Some of the recommendations are listed below:

- Application of principle of circular economy & creating awareness about it.
- Eliminate the Problematic or unnecessary plastic packaging- redesign, innovation, new delivery models.
- All plastic packaging made to be 100% reusable, recyclable or compostable
- Choosing industries in cluster which can use each other's waste.
- Synchronized comprehensive National Frame work for EPR- with Digital Platform - Buy Back/ Take Back Scheme.
- Creation of waste inventory and creating market for recycled products.
- Under EPR or CSR initiatives, brand owners or producers might provide financial help to construct the infrastructure and machinery needed for Material Recovery Facilities.
- The separation of waste at the site of generation, as well as the formalisation of recycling units through registration in accordance with CPCB guidelines, is crucial.
- SPCBs and PROs must conduct waste segregation awareness campaigns under EPR.
- More effort must be placed into formalising the unorganised sector of waste pickers. Whatever waste collection plan is chosen by the producer, importer, or brand owner, it must include criteria for their wellbeing and human capital assessment.
- For manufacturers and PIBOs, it is critical to achieve recycling targets set by states, union territories, and central regulatory authorities individually or collectively through PROs/WMAs.
- Manufacturers and PIBOs shall contribute to the EPR funds. The contribution shall be proportionate to the amount of plastic used in the country (for multi-state operators) or state.
- Recyclers must approach the PROs with an efficient recycling/recovery strategy in order to receive funding from the EPR Corpus funds in accordance with the waste management scheme proposed.

Annexure

Alternatives to Utilization of Plastic Waste as per PWM Rule, 2016

1. In Road Construction (IRC:SP:98-2013)	• Collection and segregation of plastic waste (Except chlorinated/brominated plastic waste). • Transportation and storage of plastic waste. • Cleaning and sun drying of plastic waste. • Shredding of plastic waste (2 to 4 mm size). • Heating of stone aggregate (160° C- 170° C). • Adding of shredded plastic waste (5 to 10% w/w for 30 to 40 seconds). • Coated aggregate mixed with hot bitumen (Temp 155° C to 163^0 C). • The mix-plastic aggregate bitumen mix (130^0-140° C). • The mix can be used for road laying.
2. Co-processing of Plastic Waste in Cement Kilns 	• Out of 180 cement plants, around 38 cement plants located in MP, HP, Odisha, TN etc. are using plastic waste. • Automatic feeding mechanism for feeding PW to cement kilns. • Plastic Waste is used as Alternative Fuel & Raw (AFR) Material and destroyed at temperature of around 1400°C. • PW's inorganic content gets fixed with the clinker. • Setting-up of laboratory for plastic waste analysis. • Monitoring of emission by cement industry /SPCBs. • Maintaining log-book and forwarding progress report to CPCB.

3. Conversion of Plastic Waste into liquid RDF (Oil)	• Mechanical segregation of plastic waste from mixed MSW dump-yard/ storage. • Transportation of segregated plastic waste through conveyor belt for optical segregation. Optical segregation of plastic waste (only HDPE, LDPE, PP and multilayer packaging except PVC. • Shredding of plastic waste and dislodging dust and impurities. • Transportation of segregated (100% plastic waste) into feeding hopper (reactor). • Feeding of plastic waste into reactor of random depolymerisation additives. • Collection of liquid RDF (fuel). • Collection of rejects and solid waste (charcoal) safe disposal.
4. Plasma Pyrolysis Technology (PPT)	• Pyrolysis is the thermal disintegration of carbonaceous material in oxygen starved atmosphere Plasma Pyrolysis, firstly the plastic waste is fed into the primary chamber at 580°C. • Secondary chamber temperature is maintained at 1050°C. • Conversion of organic waste into non-toxic gases (CO_2, H_2O) is more than 99%. • Segregation of the different categories of plastic waste not necessary. • At high temperature ensure treatment of all types of waste without discrimination. • Heat energy can be used for beneficial purposes. • PPT can be used in hill stations, tourist places and pilgrimage centres.

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