



Rapidly increasing recycled content in plastic packaging: six quick wins

Developed by



CII-ITC Centre of Excellence
for Sustainable Development



Supported by



Funded by



UK Research
and Innovation

Consultations: This report is a product of primary and secondary research, based on interactions with stakeholders across the plastics value chain. The India Plastics Pact is grateful to individual experts and specialists for valuable inputs and insights during the preparation of this report. The support of India Plastics Pact Member and Supporter organisations is appreciated and acknowledged.

Funder: UKRI

Date of publication: April, 2023

Copyright © 2023 Confederation of Indian Industry (CII). Published by CII. All rights reserved.

No part of this publication may be reproduced, stored in, or introduced into a retrieval system, or transmitted in any form or by any means (electronic, mechanical, photocopying, recording or otherwise), in part or full in any manner whatsoever, or translated into any language, without the prior written permission of the copyright owner. CII has made every effort to ensure the accuracy of the information and material presented in this document. Nonetheless, all information, estimates and opinions contained in this publication are subject to change without notice, and do not constitute professional advice in any manner. Neither CII nor any of its office bearers or analysts or employees accept or assume any responsibility or liability in respect of the information provided herein. However, any discrepancy or error found in this publication may please be brought to the notice of CII for appropriate correction.

Contents

Introduction 4

Factors affecting level of recycled content 7

The six quick wins 8



PET bottles in non-food contact applications



PET trays not in direct contact with food



PET blister packs in non-medical applications



HDPE bottles in non-food contact applications



LDPE/LLDPE overwraps



HDPE and PP crates

Case studies 21

Introduction

The India Plastics Pact (IPP), launched in September 2021, is a collaborative platform unifying businesses, non-governmental organizations (NGOs) and citizens to rethink the way plastic packaging is designed, used, and reused. As the first Plastics Pact in Asia, IPP joins a global community of 14 Plastics Pacts. All signatories of the India Plastics Pact work collaboratively towards achieving the following four ambitious targets by 2030:

Target 1



Define a list of unnecessary or problematic plastic packaging items and take measures to address them through redesign and innovation

Target 2



100%
of plastic packaging to be reusable, recyclable or compostable

Target 4



25%
average recycled content across all plastic packaging

Target 3



50%
of plastic packaging to be effectively recycled

Target 4 aims to reach an average of 25% recycled content across all members' plastic packaging. To achieve an average of 25% recycled content across all plastic packaging, it is appreciated that some formats and polymers will need to include more than 25% (e.g. PET beverage bottles or secondary packaging) to reflect that some packaging formats will have a greater challenge to meet the 25% target (e.g. food contact films). The target encourages closed-loop recycling of plastic packaging, maintaining high material quality throughout the plastics value chain, and increasing demand for recycled content. This is supported by Target 1 (elimination of unnecessary or problematic plastic packaging items), Target 2 (design for recyclability) and Target 3 (increased overall recycling rates) of the Pact.

This document aims to contribute to the achievement of Target 4 by identifying plastic packaging formats where:

- recycled content is already being used in India and/or internationally
- use of recycled content can be increased more readily

Benefits of increasing recycled content in packaging

Inclusion of recycled content in packaging will lead to



An increase in value of post-consumer packaging waste, resulting in a higher income for waste workers



Reduced littering



Less dependence on virgin plastics



A reduction in carbon impact (GHG emissions) of packaging



Achievement of EPR targets.¹



Increased recognition for brand owners

Recent changes in India's Plastic Waste Management Rules (specifically, via the EPR Guidelines in 2022) have given businesses a clear policy direction for a circular plastics economy.

The Guidelines set out targets for inclusion of recycled content in packaging. These targets range from 30% to 60% for rigid packaging, and 5% to 20% for flexible packaging, starting in the year 2025-26.¹

The end use of packaging containing recycled content, however, will be partly determined by regulations drawn up by the Bureau of Indian Standards (BIS), and additionally by the Food Safety and Standards Authority of India (FSSAI) in case of food-contact packaging.

This document identifies at least six packaging formats where inclusion of recycled content is more likely to be achievable in the short term given the current regulations.



¹ Ministry of Environment, Forest and Climate Change, Government of India (2022). Guidelines on Extended Producer Responsibility for Plastic Packaging. G.S.R. 133(E). <https://egazette.nic.in/WriteReadData/2022/233568.pdf>

Definitions

What is considered recycled content?

Recycled content refers to the proportion, by mass, of post-consumer recycled material in a product or packaging. ISO 14021's usage of the term clarifies post-consumer material as, "material generated by households or by commercial, industrial, and institutional facilities in their role as end users of the product which can no longer be used for its intended purpose. This includes returns of material from the distribution chain".²

What is meant by closed-loop recycling?

Closed-loop recycling refers to the recycling of plastics into same or similar quality applications. Closed-loop mechanical recycling keeps the quality of the materials at a similar level by cycling materials into the same application (e.g. from PET bottle to PET bottle) or into applications requiring materials of similar quality. As such, mechanical closed-loop recycling not only preserves the value of the material, but also maintains the range of possible applications in future, additional loops.³

What is meant by open-loop recycling?

Open-loop recycling refers to recycling of plastics into different or lower quality applications. Given the inherent quality loss during mechanical recycling, closed-loop mechanical recycling cannot continue indefinitely. In open-loop mechanical recycling, polymers are also kept intact, but the degraded quality and/or material properties require applications with lower demands.³

² Ellen MacArthur Foundation (2019). New Plastics Economy Global Commitment Progress Report. <https://archive.ellenmacarthurfoundation.org/assets/downloads/Global-Commitment-2019-Progress-Report.pdf>

³ Ellen MacArthur Foundation (2016). The New Plastics Economy Rethinking the Future of Plastics. <https://ellenmacarthurfoundation.org/the-new-plastics-economy-rethinking-the-future-of-plastics>

What are the requirements for increasing the uptake of recycled content in packaging?

The following factors play a key role in enabling uptake of recycled content in a specific type of packaging.



Design

The recyclability of a packaging item depends largely on its design and physical properties such as size, colour, resin, and additives. When packaging waste is recycled, these factors also determine if the recyclate is suitable for incorporation into new packaging.



Collection

A reliable stream of input feedstock will lead to the reliable, high-quality recyclate stream needed by brands: effective and consistent mechanisms to collect plastic waste from households and commercial establishments will ensure a regular supply of feedstock for recyclers.



Recycling capacity and technology

The installed capacity and technology used for recycling packaging waste plays a crucial role in determining how much good quality recyclate can be supplied to converters and packaging producers.



Cost

The cost of recyclate and of additional machinery/changes in existing machinery affects decisions about how much recycled content can be added to packaging.



Will

For there to be an inclusion of recycled content, brands need to be willing to use it in their packaging. Sometimes packaging with recycled content might look slightly different from packaging made of virgin plastic, so brand owners and consumers might need to accept this. Brands owners should specify recycled content as part of their procurement process.

The six quick wins

This section lists out six plastic packaging items where inclusion of recycled content is more likely to be achievable in the short term and can be increased



For each of these applications, the following have been identified:

- **Opportunities:** factors in the current plastic value chain enabling the use of recycled content
- **Actions needed:** interventions to increase the ease of including recycled content



PET bottles in non-food contact applications

Examples: bottles for shampoos, conditioners, shower gels, lotions, and dish-washing liquids

Possible inclusion rate
20% to 100%

Opportunities

PET bottles are widely collected.

Better-quality feedstock is available for recycling PET bottles when compared to feedstock available for recycling PE and PP bottles.

Most PET bottles are recyclable by design.

Bottle-to-bottle recycling in non-food contact applications (such as personal care products) is technically feasible.

Actions needed



Design

Brand owners commit to ensuring their PET bottles are designed for recycling.



Recycling capacity and technology

Recycling industry to invest in machinery to increase supply of recycled PET suitable for bottle-to-bottle recycling.



Will

Brand owners and converters to collaborate actively to enable incorporation of recycled content.



PET trays not in direct contact with food

Examples: packaging trays for cosmetics, and packaging trays for individually wrapped chocolates

Possible inclusion rate
50% to 100%

Opportunities

PET bottles are widely collected, thus there is sufficient feedstock available for bottle-to-tray recycling.

Recycling PET bottles into PET trays does not require advanced processes such as solid-state polycondensation (SSP).

PET trays are an alternative end-market (apart from textiles) for the PET flakes produced in India.

Actions needed



Will

Increase awareness of the feasibility of PET bottle-to-tray recycling and PET tray-to-tray recycling.

Brand owners commit to increasing recycled content in trays.



PET blister packs in non-medical applications

Examples: blister packs for toothbrushes, and blister packs for lip care products

Possible inclusion rate
25% to 80%

Opportunities

PET bottles are widely collected, thus there is sufficient feedstock available for bottle-to-blister pack recycling.

Recycled PET flakes can be easily added as recycled content in PET blister packs if solid-state polycondensation (SSP) machinery (which is required for bottle-to-bottle recycling) is not available.

Actions needed



Will

Build awareness of the feasibility of using recycled content in PET blister packs.

Brand owners commit to increasing recycled content in blister packs.

Brand owners to increase acceptance of reduced clarity and presence of spots in transparent blister packs, which is caused by addition of recycled content.



HDPE bottles in non-food contact applications

Examples: bottles for shampoos, conditioners, shower gels, lotions, detergents, and fabric conditioners

Possible inclusion rate
25% to 100%

Opportunities

HDPE bottles are widely collected.

Recycled content in HDPE bottles used to package home care and personal care products is not regulated.

Actions needed



Design

Light colours with low pigment concentration to be used in HDPE bottles as the usage of dark colours limits end-use applications of recycled HDPE bottles.

Use of PP caps and closures in HDPE bottles to be limited as they contaminate the HDPE recycling process.

Production of masterbatch to be regulated to prevent the presence of heavy metals.



Recycling capacity and technology

Increase capacity of HDPE bottle-to-bottle recycling to increase availability of rHDPE which can meet brands' specifications.

Cleaning processes of recyclers to adhere to standards laid down by EU-Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH)⁴ or Toxics in Packaging Clearinghouse (TPCH).⁵

Deodorization machines to be employed to reduce/remove odour from recycled granules of HDPE bottles. Also, technical capacity to be increased for operating deodorization technology.



Will

Brand owners commit to increasing recycled content in HDPE rigid bottles.

Brand owners to accept minor discolouration in HDPE rigid bottles with recycled content.

⁴ EU- Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH). https://ec.europa.eu/environment/chemicals/reach/reach_en.htm

⁵ Toxics in Packaging Clearinghouse. <https://toxicsinpackaging.org/>



LDPE/LLDPE overwraps

Examples: pallet wrap, shrink wrap and bundling wraps

**Possible inclusion rate
15% to 50%**

Opportunities

LDPE/LLDPE overwraps are widely available and collected.

LDPE/LLDPE overwraps are relatively clean as they are obtained from industrial and commercial establishments.

Some discoloration because of recycled content is tolerable in LDPE/LLDPE overwraps as clarity is not essential in secondary packaging.

Actions needed



Recycling capacity and technology

Recycling industry to invest in machinery to increase supply of recycled LDPE/LLDPE overwraps.



Will

Increase awareness of the feasibility of including recycled content in LDPE/LLDPE pallet wraps.

Brand owners commit to increasing recycled content.

Brand owners to increase acceptance of reduced clarity, and formation of gels and spots, caused by the addition of recycled content.

Brands owners and converters to collaborate actively to incorporate recycled content.



HDPE and PP crates

Examples: vegetable crates, fruit crates, and milk crates

Possible inclusion rates:

HDPE: 20% to 60%

PP: 30% to 80%

Opportunities

HDPE and PP crates are widely available and collected.

HDPE and PP crates are relatively clean as they are obtained from industrial and commercial establishments.

Some discoloration because of recycled content is tolerable in HDPE and PP crates as clarity is not essential in secondary packaging.

Actions needed



Recycling capacity and technology

Converters to ensure that the strength of the crates is not compromised by the addition of recycled content.



Will

Build awareness of the feasibility of including recycled content in HDPE and PP crates.

Brand owners commit to increasing recycled content.

Brands owners and converters to collaborate actively to incorporate recycled content.

Case studies

Use of recycled content in packaging by India Plastics Pact members

Mondelez India Foods Private Limited has introduced PET trays in their multi-SKU Cadbury Celebrations pack which contain 80% rPET.



Marico Limited uses 10% rPET in the bottles of its hair oil product, Nihar Shanti Amla.



ITC Limited uses 50% rPET in Fiana Showergel bottles of sizes 125 ml, 250 ml, and 500 ml.



List of abbreviations

BIS	Bureau of Indian Standards
EPR	Extended Producer Responsibility
FSSAI	Food Safety and Standards Authority of India
GHG	greenhouse gas
HDPE	high density polyethylene
LDPE	low density polyethylene
LLDPE	linear low-density polyethylene
PET	polyethylene terephthalate
PP	polypropylene
REACH	Registration, Evaluation, Authorisation and Restriction of Chemicals
rHDPE	recycled high density polyethylene
rPET	recycled polyethylene terephthalate
SSP	solid state polycondensation
TPCH	Toxics in Packaging Clearinghouse



About the India Plastics Pact

The India Plastics Pact is a collaboration between the Confederation of Indian Industry (CII) and WWF India that unites businesses, governments, NGOs and citizens to create a circular plastics economy in India. The CII-ITC Centre of Excellence for Sustainable Development (CESD) anchors the India Plastics Pact, within CII. The initiative is supported by WRAP, a global NGO based in the UK.

Launched in September 2021, the India Plastics Pact is the first Plastics Pact in Asia. As of March 2023, there are 14 Plastics Pacts spread across the globe. 45 organizations are currently part of the India Plastics Pact. The Pact works on all plastic resins at all stages of the plastics value chain.

www.indioplasticspact.org



Confederation of Indian Industry

About Confederation of Indian Industry

The Confederation of Indian Industry (CII) works to create and sustain an environment conducive to the development of India, partnering Industry, Government, and civil society, through advisory and consultative processes. For more than 125 years, CII has been engaged in shaping India's development journey and works proactively on transforming Indian Industry's engagement in national development. CII engages closely with Government on policy issues and interfaces with thought leaders to enhance efficiency, competitiveness and business opportunities for Industry through a wide portfolio of specialized services and strategic global linkages.

India's premier business association has around 9,000 members, from the private as well as public sectors, and an indirect membership of over 300,000 enterprises from around 286 national and regional sectoral industry bodies. With 62 offices, including 10 Centres of Excellence in India, and 8 overseas offices in Australia, Egypt, Germany, Indonesia, Singapore, UAE, UK, and USA, as well as institutional partnerships with 350 counterpart organizations in 133 countries, CII serves as a reference point for Indian Industry and the international business community.



About WWF India

WWF India is committed to creating and demonstrating practical solutions that help conserve India's ecosystems and rich biodiversity. With more than 50 years of conservation journey in the country, WWF India works towards finding science-based and sustainable solutions to address challenges at the interface of development and conservation. WWF India is part of the WWF network, with offices in over 100 countries across the world. WWF India works in many states of India, through our state and field offices. The organisation works in different geographical regions and across thematic areas, including the conservation of key wildlife species and their habitats, management of rivers, wetlands and their ecosystems. On the sustainability side, the focus areas are climate change adaptation, driving sustainable solutions for business and agriculture and empowering local communities as stewards of conservation. WWF India also works in combatting illegal wildlife trade and in bringing environment education to students through outreach and awareness campaigns.



About WRAP

WRAP is a climate action NGO working around the globe to tackle the causes of the climate crisis and give the planet a sustainable future. Our vision is a thriving world in which climate change is no longer a problem. We believe that our natural resources should not be wasted and that everything we use should be re-used and recycled. We bring together and work with governments, businesses and individuals to ensure that the world's natural resources are used more sustainably. Our core purpose is to help tackle climate change and protect our planet by changing the way things are produced, consumed and disposed of. We support partner NGOs around the world to deliver real change through collaboration and progress from over 300 of the world's largest businesses. Initiatives we support include: Plastics Pacts in Chile, Kenya and India; food waste agreements in Mexico, South Africa and Indonesia; and food waste citizen campaigns through our Love Food Hate Waste brand in Canada, Australia and New Zealand.



About UKRI

UK Research and Innovation (UKRI) was launched in April 2018. It is a nondepartmental public body sponsored by the Department for Business, Energy and Industrial Strategy (BEIS). It brings together the seven disciplinary research councils, Research England, which is responsible for supporting research and knowledge exchange at higher education institutions in England, and the UK's innovation agency, Innovate UK. UKRI's nine councils work together in innovative ways to deliver an ambitious agenda, drawing on our great depth and breadth of expertise and the enormous diversity of our portfolio. Through our councils, we maintain and champion the creativity and vibrancy of disciplines and sectorspecific priorities and communities. Our councils shape and deliver both sectoral and domain-specific support. Whether through research council grants, qualityrelated block grants from Research England, or grants and wider support for innovative businesses from Innovate UK, we work with our stakeholders to understand the opportunities and requirements of all the different parts of the research and innovation landscape, maintaining the health, breadth, and depth of the system.



**INDIA
PLASTICS
PACT**

Developed by



Confederation of Indian Industry



CII-ITC Centre of Excellence
for Sustainable Development



Supported by



This report is funded by



UK Research
and Innovation