Plastic Waste Management in Singapore

Workshop for Competitive Research Programme on Segregation and Value Recovery for Plastics

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National Environment Agency

Safeguard · Nurture · Cherish

Objectives

By the end of this presentation, we hope the participants will be able to:

1. Develop an appreciation of Singapore's waste management strategies

2. Understand the plastic waste situation in Singapore

3. Explore possible R&D scope that can address the local challenges in relation to plastic waste management

1 Overview of Singapore's Waste Management Strategies

With specific focus on plastic waste

Key Challenges – Waste Growth and Land Scarcity

At the current rate of waste disposal, we will need to build:

1 **WTE Plant**

Every 7-10 years

1 **Landfill**

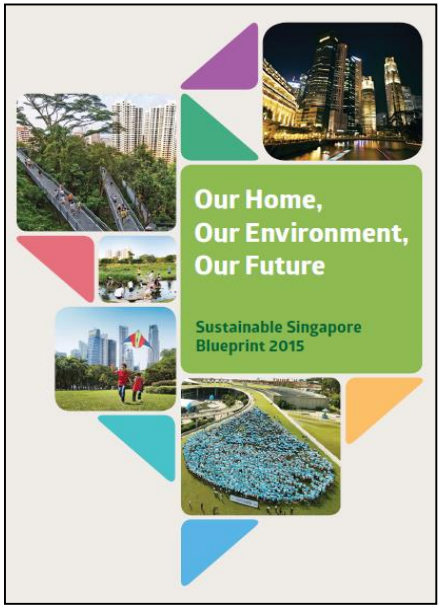
Every 30-35 years

Semakau Landfill

Sustainable Singapore Blueprint 2015 (SSB2015)

A Vibrant & Sustainable City

A Zero Waste Nation



Sets out the national vision and plans for the next phase of sustainable development

SSB 2030 Targets

70%
Overall recycling rate

30%
Domestic recycling rate

81%
Non-domestic recycling rate

Waste Management Strategies

Waste Minimisation / Prevention

Right-price waste disposal services
Promote efficient use of resources in production processes

Recycling

Maximise resource recovery from waste
Adopt viable & efficient recycling methods for environmental sustainability

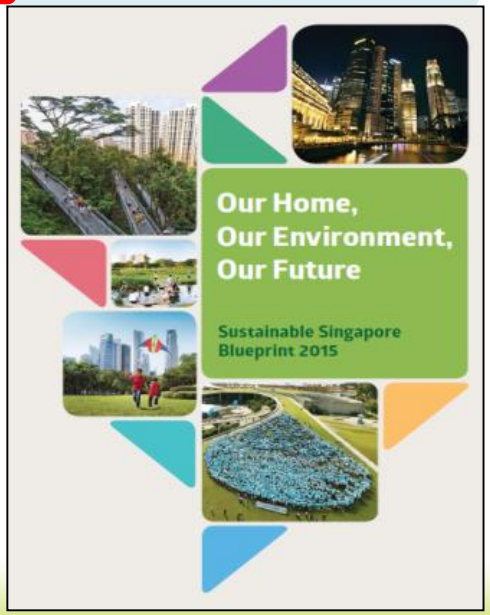
Waste-to-Energy / Volume Reduction

Adopt innovative technologies to maximise energy recovery, and minimise land-take & ash residue

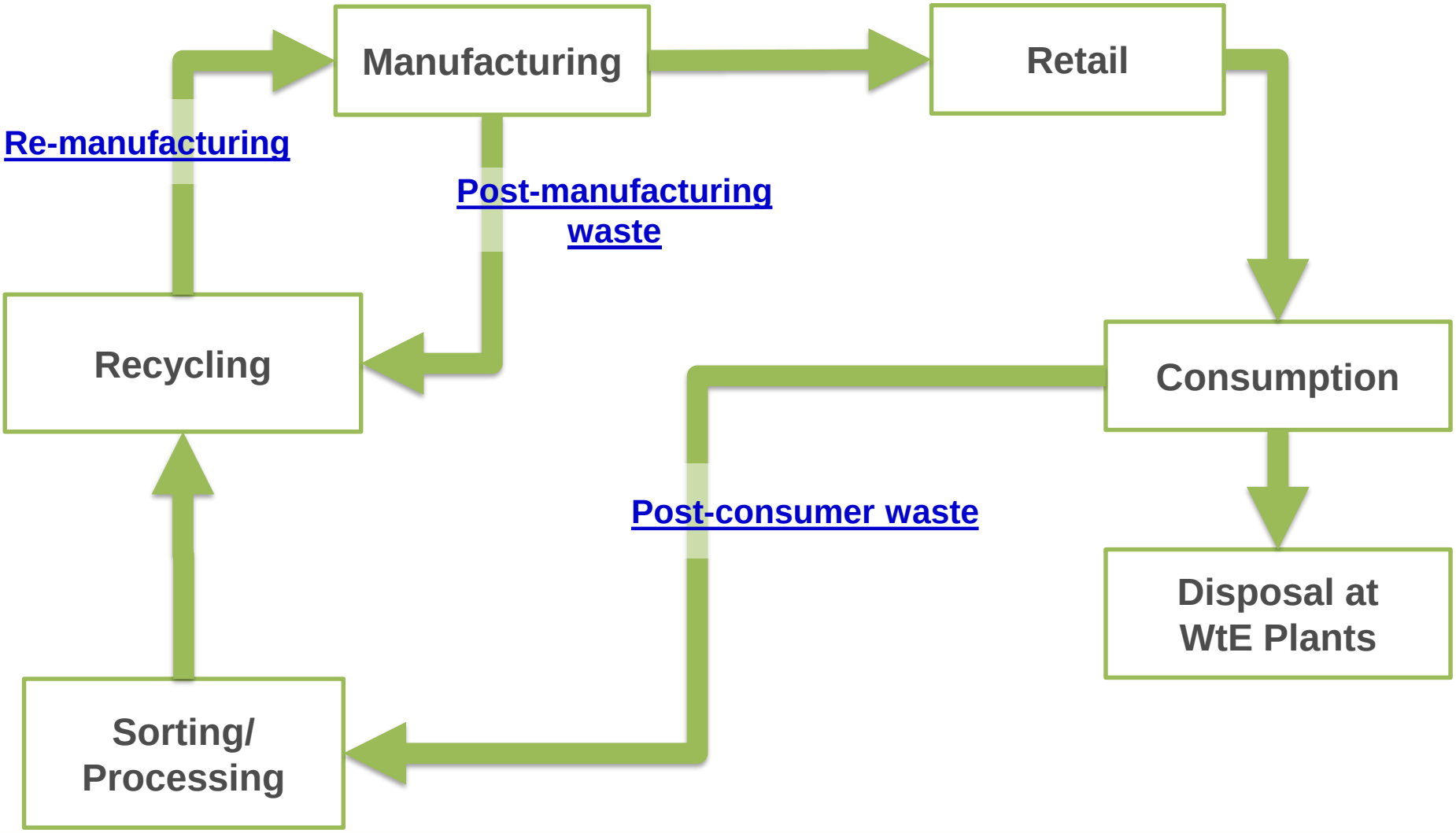
Landfill

Minimise landfilling demand and maximise landfill lifespan

Towards a "Zero Waste Nation"



General Plastics Material Flow in Singapore



2 Strategy 1: Waste minimisation/ Prevention

Strategy 1: Waste Minimisation/Prevention

Singapore Packaging Agreement

Voluntary industry-government platform to promote packaging waste 3Rs

- 1st SPA launched in **July 2007**
- **39,000** tonnes of packaging waste avoided & **SGD93 mil** saved
- 2nd SPA has been **extended till 2020**
- Launched **Packaging Benchmark Database**
- Enhanced **Recognition** under SPA Awards
- Promote **Logo for Products with Reduced Packaging**
- Introduce **Mandatory Requirements** by 2021

Recipients of SPA Awards 2017 with Minister Masagos Zulkifli at the SPA Awards Ceremony and Gala Dinner on 5 June 2017

Annual 3R Packaging/SPA Awards booklets with the commendable work done by the winners

An initiative of the SPA
www.nea.gov.sg/SPA

The Logo for Products with Reduced Packaging

Strategy 1: Waste Minimisation/Prevention

Mandatory Waste Reporting

Commercial premises can benefit by recycling more and saving on waste disposal cost

Large hotels & malls are required by law to submit waste disposal and recycling data, waste reduction plans & targets since **2015**

Working with hotels and malls to improve their waste management practices

Premises can tap on **3R Fund** to co-fund initiatives on waste minimisation and recycling

Disallowed use of disposables for dine-in

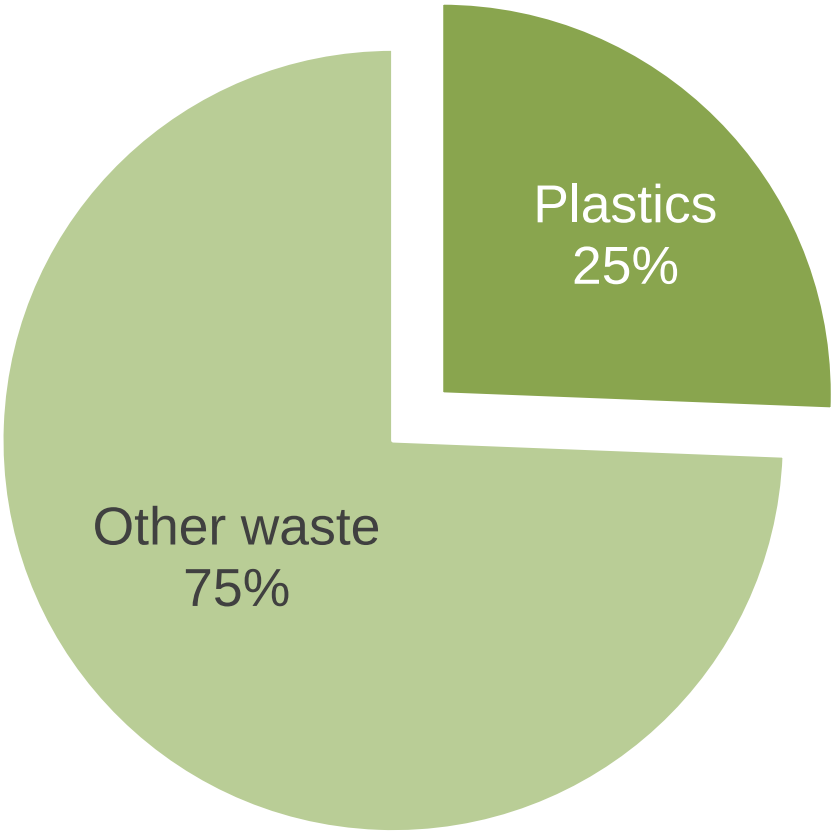
NEA and MEWR have disallowed the use of disposables for dine-in at new hawker centres

Examples of these new hawker centres include Yishun Park, Pasir Ris Central, and Our Tampines Hub

NEA is continuously working with stakeholders to encourage the use of reusables

Strategy 1: Waste Minimisation/Prevention

Breakdown of waste disposed of in 2017



Problem Statement

- With growing amount of waste generated in Singapore, a part of it is attributed to the prevalent use of plastics including single-use plastics (disposables) due to several factors such as need for convenience, protection of products, prevention of cross contamination of food items.

- Excessive packaging (e.g. for some types of packaged products) is also a key concern as it is a waste of precious resources and puts a strain on our waste management infrastructure.

- How can R&D help to enable use of plastic in a more sustainable manner, and facilitate a reuse culture, while maintaining comparable levels of convenience, protection, aesthetics and other functionalities?

3 Strategy 2: Recycling

Strategy 2: Recycling

Recycling of Domestic Wastes

National Recycling Programme (NRP)

10,000 **Recycling Bins HDB estates**

1 660L Recycling Bin per HDB block

1 120L Recycling Bin per landed unit

Mandatory recycling receptacles for all condominiums

100% Schools recycling corner programme

Dual Chutes for General Waste and Recyclables

Increased convenience in recycling

All new public housing launched from 2014 are to be fitted with dual chutes (for refuse and recyclables).

From 1 April 2018, all new non-landed private residential developments taller than four storeys will also be required to provide dual chutes for refuse and recyclables.

Strategy 2: Recycling

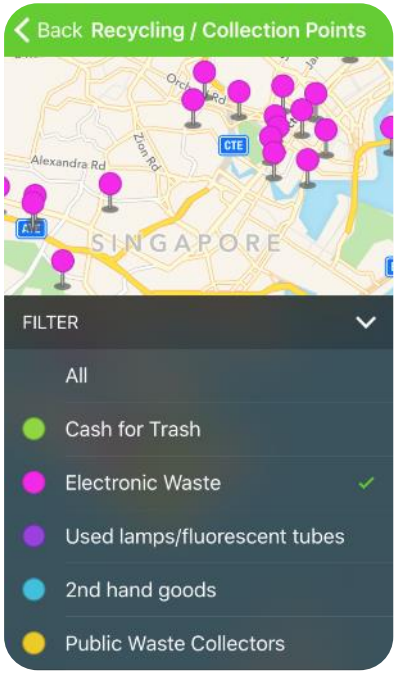
Outreach to Domestic Sector

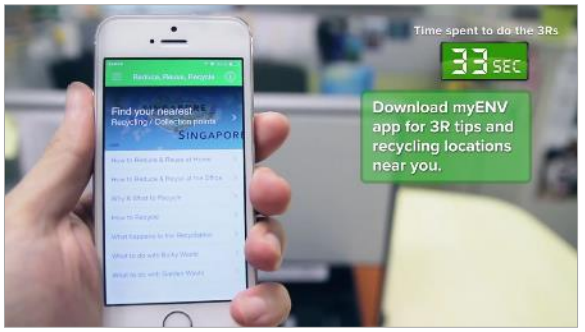
Community

Outreach collaterals to educate consumers and increase domestic recycling

These include posters, fridge magnets and a video to show how the 3Rs can be easily incorporated into our daily lives.

Location of e-waste collection points and cash for trash stations can also be found on the 'myENV' mobile app





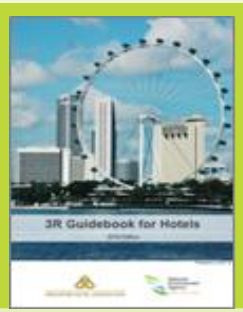
Strategy 2: Recycling (as part of 3R outreach)

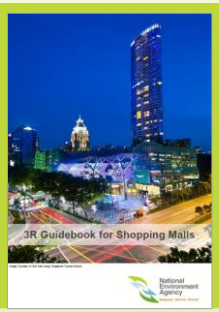
Outreach to Corporate Sector

Hotels and Malls

Biennial **3R Awards for Hotels and 3R Awards for Shopping Malls** to recognise participants who have performed well in the area of solid waste management

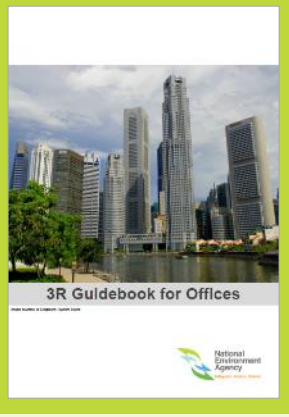
The **3R Guidebooks for Hotels and Malls** provide practical step-by-step guidelines on planning and implementing a 3R programme





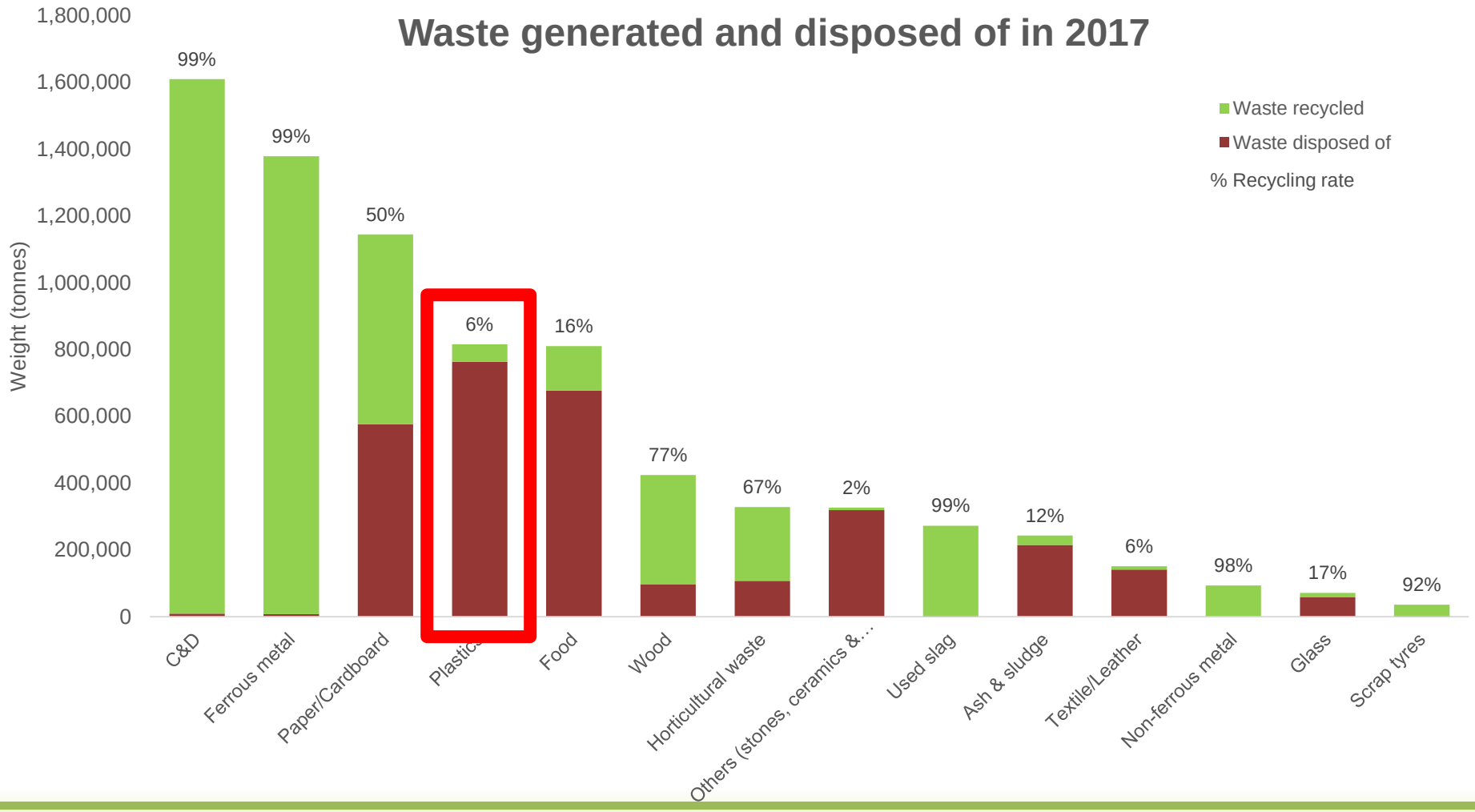
Offices and MICE

The **3R Guidebook for Offices** help offices assess current waste management practices and identify opportunities to reduce, reuse and recycle waste materials so as to reduce waste disposal needs



The **3R MICE Toolkit** is a handy online guide on waste minimisation and recycling for the MICE industry.

Strategy 2: Recycling



Problem Statement

- The presence of contamination of recyclables with food waste, often presents a challenge to achieve a high recovery/recycling rate of plastics.

- Single-use plastics may not be economically viable to recycle especially if they are contaminated with food residues (e.g. takeaway food containers); this is similar for multi-material packaging (e.g. composite packaging of which plastic is a component) as most recycling technologies can only process single/homogenous types of plastics.

Problem Statement (con't)

- The value of plastics depending on its market demand and supply can also affect the economic viability of plastic recycling. Therefore, conversion of plastic waste into high value products of demand could help to improve the recycling rate of plastics.

- How can R&D help to:

  - Improve recyclability of plastics including contaminated plastics and multi-material packaging (of which plastic material is a component)?

  - Produce higher value recycled plastic products so as to increase their take-up rate and help in promoting the use of recyclables as secondary materials in producing new products?

4 Life-cycle Assessment (LCA) of Carrier Bags and Food Packaging

Life-cycle Assessment of Carrier Bags and Food Packaging

- A study commissioned by NEA has found that consumers can reduce their impact on the environment by opting to use reusable bags and food containers, instead of disposables.
- The waste challenges faced by countries are not identical. In Singapore, as we incinerate our waste, promoting certain types of disposables (e.g. paper or bio-degradable disposables) may not be better for the environment.
- Therefore, NEA will step up collaborations with organisations to implement outreach and publicity initiatives that encourage consumers to take only what they need, and bring their own reusable bags and containers.

(From left to right) Corn starch plate; paper plate; paper container with inner plastic sheet, paper container with wax coating; and brown paper wrapping with plastic coating.

(From left to right) HDPE bag; LLDPE bag; PLA bag; corn starch bag; and oxo-degradable bag.

Possible R&D Scope

1. Develop solution(s) which minimise the use of plastics while retaining the functional effectiveness

2. Improve recyclability of plastics and/or materials comprising of plastics (e.g. design for recyclability, use of mono-material packaging)

3. Enhance recycling capabilities for plastics (e.g. able to process plastics which are hitherto hard to recycle or reuse into high value material(s) or product(s) of demand, enable separation of multi-material packaging into its individual component to facilitate recycling)

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