ALBA
Treasure raw materials.

Overview of Waste Management in South-East Asia

Singapore, 2021

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SMART CITY SOLUTIONS

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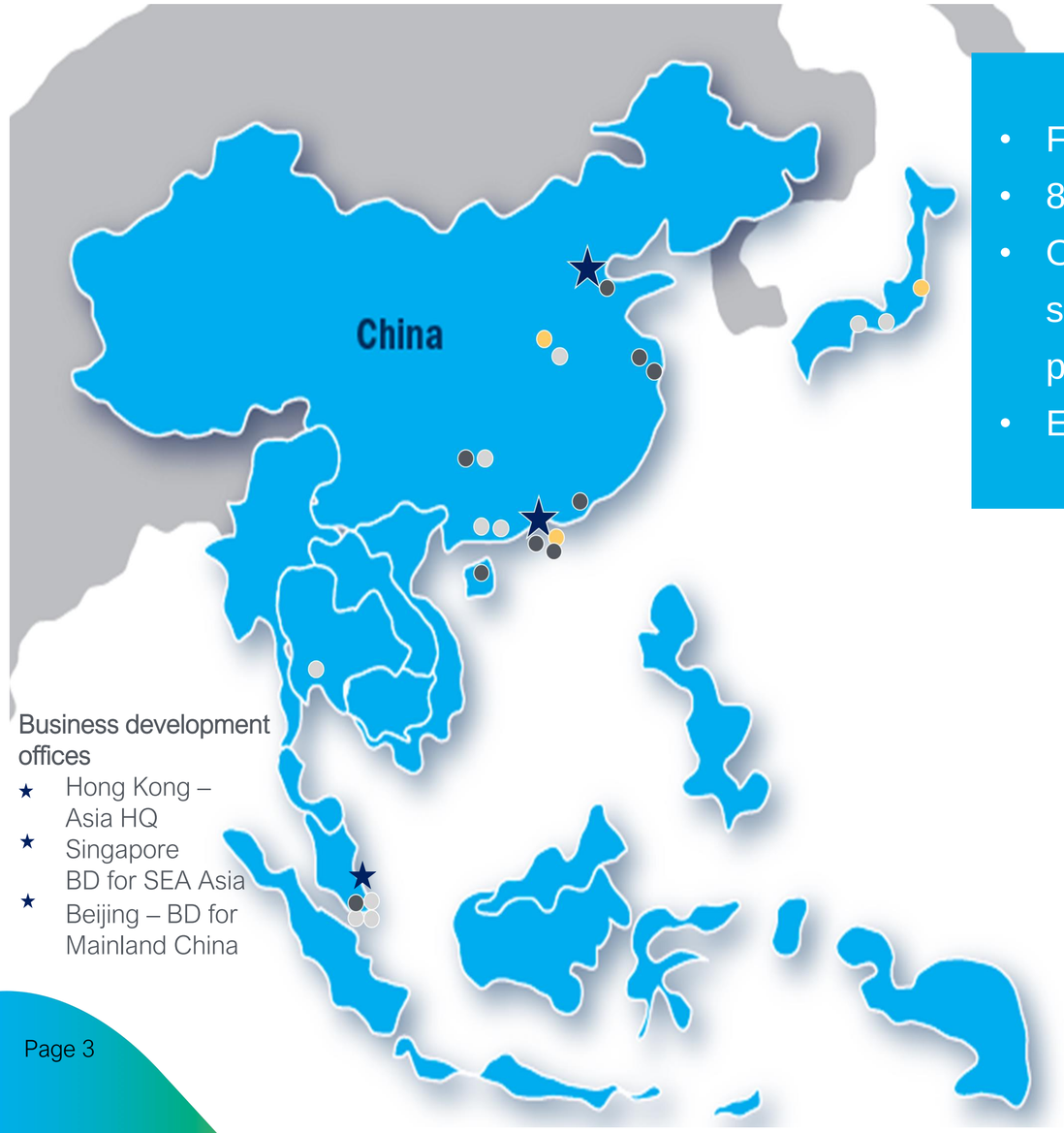
ALBA Group in Asia

A European Waste Management Company in Asia – Thanks to the commitment of the Owners



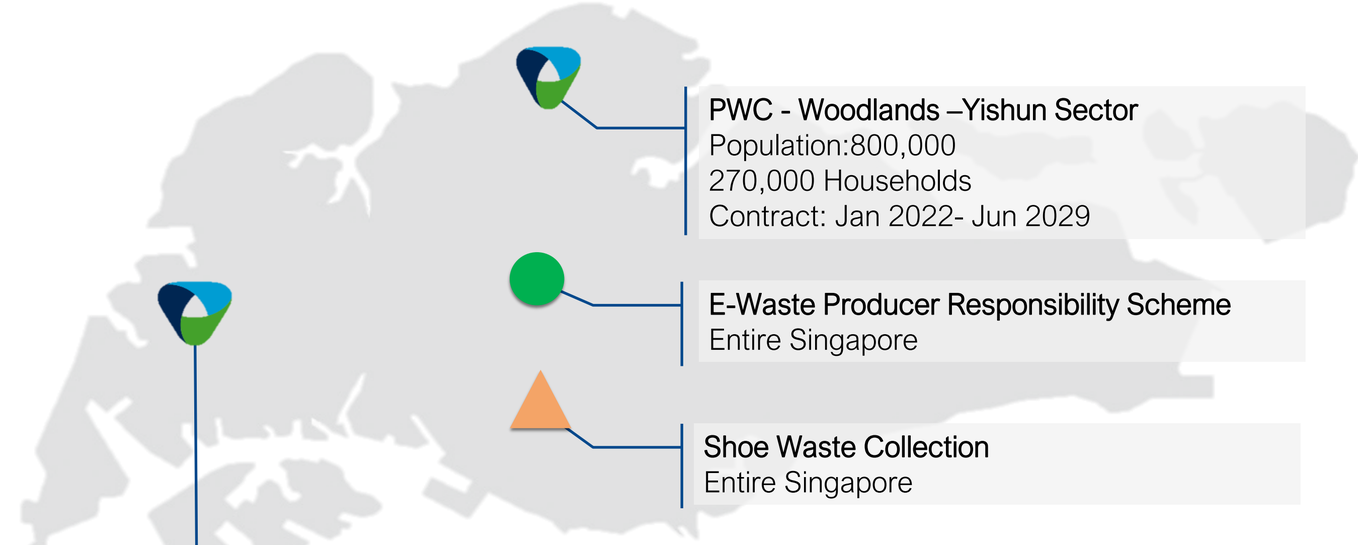
- Family-owned business since 1968
- 8,800 global staff (2019)
- One of the leading recycling and environmental services companies as well as raw material providers worldwide
- Euro 2.0 billion global turnover (2019)

Four Verticals:

- Hazardous Waste
- Biodegradable waste
- Plastics Recycling
- Smart City Solutions

A Glance at ALBA’s operations in Singapore

2 Years – 4 Projects



PWC - Woodlands –Yishun Sector
Population:800,000
270,000 Households
Contract: Jan 2022- Jun 2029

E-Waste Producer Responsibility Scheme
Entire Singapore

Shoe Waste Collection
Entire Singapore

PWC -Jurong Sector
Population:500,000
156,000 Households
Contract: Apr 2020- Mar 2027

Public Waste Collection: 2 / 6 Sectors
Serves premises – comprising 426,000 households and trade premises, including hawker and market stalls, shops, places of worship, and government buildings

General Waste Collection: Nationwide
Wider access to other regions in Singapore through commercial waste contracts for universities, malls, condos, and other businesses.

E-Waste PRS: Nationwide
Operating as Producer Responsibility Organization, acting as clearing house and managing the complete process of collecting regulated E-Waste for all of Singapore.

Shoe Waste collection: Nationwide
Operating as the collector for the first ever shoe recycling system to turn the rubbered shoe soles to playgrounds and running tracks.

Step up for a zero waste nation

Singapore’s Waste Management Targets

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As a part of realizing the set targets, Singapore has defined mainly two plans:
Zero Waste Master Plan and **Green Plan 2030**. The key milestones applicable for the Waste Management Services Industry are listed below:

2022

Mandatory Packaging reporting

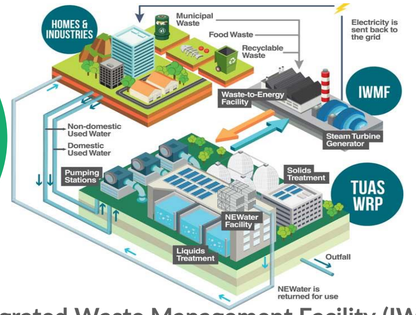
2021

1. E-Waste EPR Scheme
2. Multistorey Recycling Facility

2023

Deposit Refund Scheme

2024



1. Integrated Waste Management Facility (IWMF-Ph1 +MRF
2. Mandatory Food waste segregation

2025

1.EPR for packaging
2. Segregated glass & food-waste collection
3. IWMF Ph2: Food-waste treatment

2030

1. Achieve recycling rate of 70%
2. Double Land Productivity
3. Produce 30% food locally

2035

Prolong lifespan of Semakau Landfill beyond

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Opportunities and Challenges in Singapore

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The ambitious targets set by the Singapore Government raises opportunities for new technologies, smart infrastructure systems and solutions that would increase productivity.

Some of the Solutions in demand include:

Food-waste collection and transportation systems:
- decrease in water content while transporting
- Solutions helping to increase overall efficiency
- pre-treatment systems for plastics separation, etc.

Return station technologies for Deposit Refund Scheme:
- technology driven collection and refund systems like reverse vending machines, etc.
- solutions that allow larger collection volumes in compact spaces like in existing shops and markets.

Recycling technologies for food-waste, negative value plastics
- equipment, technology, automisation solutions

Smart systems
- IoT and other Digitalisation tools

Some challenges include:

- Lack or **high costs for land** for setting up recycling infrastructure
- The current **lack of proper Recyclables' segregation infrastructure** leading to the need for sorting and pretreatment for recycling projects
- **Lack of manpower** for any sorting or collection operations demands automisation of collection and plant operations.
- The island-wide waste management fee collected from households does not encourage use of highly automised technologies, as the **tenders and local market are still very price driven.**

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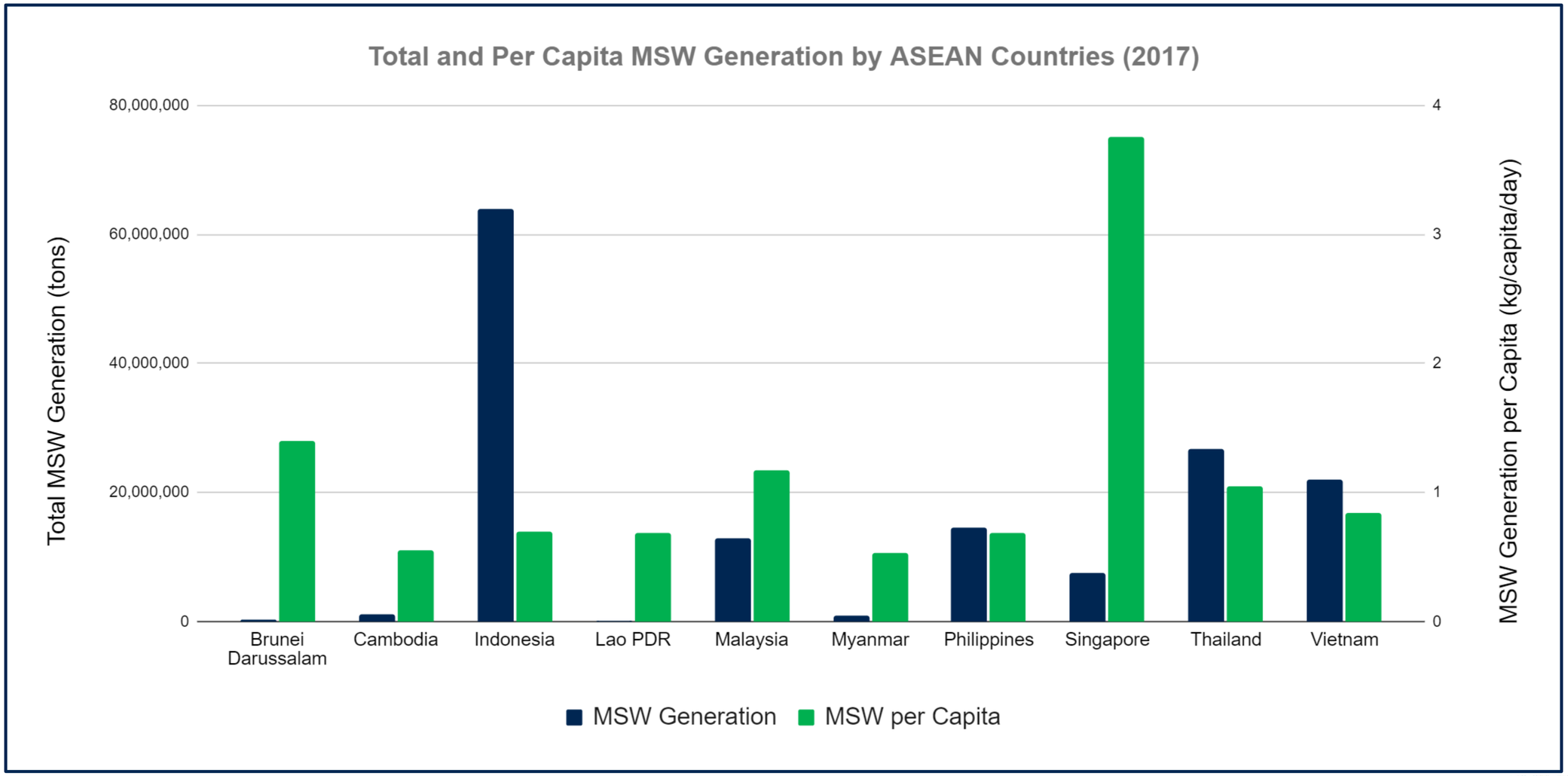
Southeast Asia Overview

MSW Characteristics



Waste Management in ASEAN Countries: Summary Report, UNEP (2017)

Southeast Asia Overview

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Key Issues

Issues	Description	Implications
2018 China National Sword Policy	• Before 2018, China was the **main destination of plastic scrap** from around the world, receiving 51% of the world's plastic scrap imports. • China implemented a **ban on the import of plastic scraps** into the country in 2018 which resulted in a 99.1% decrease in scrap plastic imports. • This, in turn, caused a large amount of plastic scraps to be **diverted to Southeast Asia.**	• ASEAN countries began implementing their **own import and export restrictions** • **More attention** is being paid by ASEAN governments and the public with respect to the issue of plastic waste
Increasing consumption	• A **sharp increase in consumption** is expected due to **increasing population** (total ASEAN population is expected to increase by 11% to 710 million by 2030) and **increasing income levels** (estimated growth of 6% - 8% annually until 2030)	• Increasing consumption levels will result in an **increase in waste generated**.
Underfunded waste management budgets	• Competing infrastructure priorities (e.g., clean water, electricity) reduce the amount available to develop the waste management sector. • Only about 40% of costs are recovered during *waste management.* Landfill tipping fees and waste collection fees are typically much lower than developed countries.	• **Waste collection coverage** varies from between 76% - 100% in developed, urban areas and 10% - 55% in less developed, rural areas. • Alternative sources of funding required to collect and manage waste properly.
Creation of Voluntary Industry-led Packaging Recovery Organisations (PROs)	• Voluntary PROs are formed by companies (typically from FMCG sector) to work together to increase collection and recycling rates of packaging materials. • These PROs are already operating in Indonesia (IPRO), Malaysia (MAREA), Vietnam (PRO Vietnam)	• High interest from FMCG companies creates opportunities to get support and partnership from these companies through the PROs.

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Southeast Asia Overview

Upcoming Trends in Waste Management

Technologies

Chemical Recycling

Chemical recycling is an area of interest due to the relatively high proportion of multilayer plastics which do not currently have a reliable solution at scale.

Organic Waste Recycling

Organic waste recycling would provide an avenue to extract value from the relatively high proportion of organic waste in ASEAN

Digitalization

The waste and recycling sector is a sector which is still lagging in terms of digitalization. Implementing digital systems will increase the efficiency and reliability of the sector

Automation

Waste management and recycling jobs tend to be seen as ‘dirty jobs’ and are hence a tough position to recruit for. Having automated systems will reduce the need for more manpower

Systems

Extended Producer Responsibility

A number of ASEAN countries already have a framework for EPR in the legislation and are starting to implement EPR systems. EPR would increase the availability of resources to collect and treat waste materials.

Deposit Refund Systems

The interest in Deposit Refund Systems is also increasing to more efficiently collect and treat high-value plastics such as PET and HDPE. This system results in a more efficient collection of these streams of waste and increase cost recovery of waste collection.

Southeast Asia Overview

Upcoming Policies in Waste Management