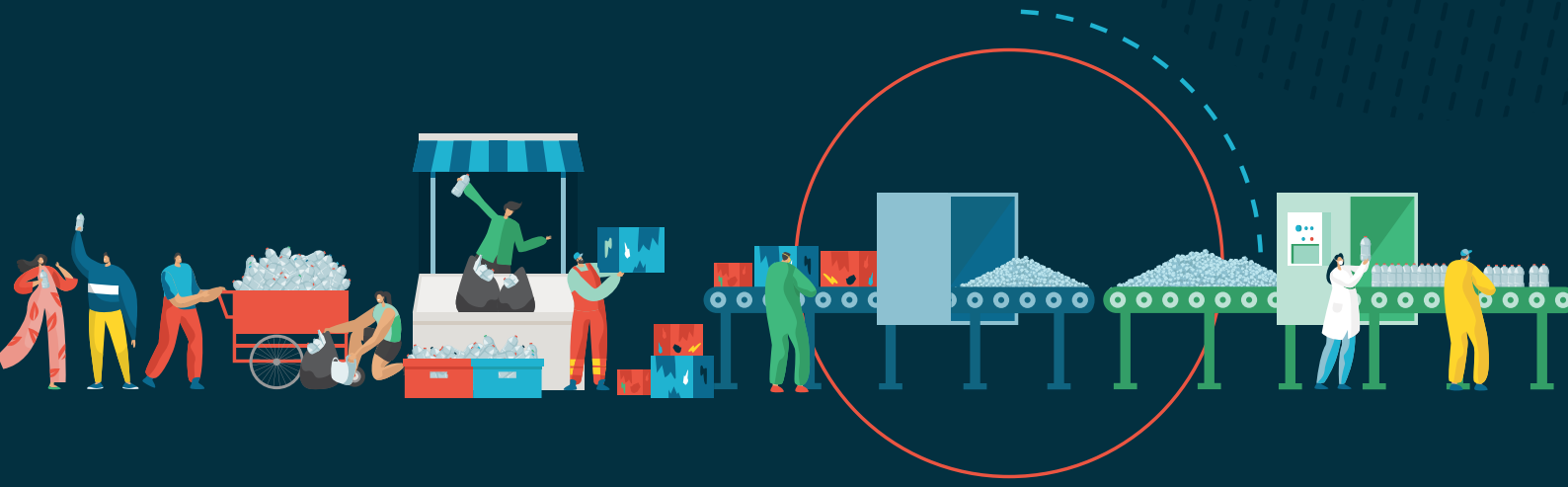
GA CIRCULAR



FULL CIRCLE

Accelerating the Circular Economy for Post-Consumer PET Bottles in Southeast Asia

Commissioned by

Coca-Cola

Executive Summary

In recent years, the global momentum for rethinking the way plastic packaging is produced, consumed and disposed of has grown faster than ever. The largely linear approach to the way plastic packaging enters and exits our lives for fleeting moments has reached its limits and the challenges have become apparent. In 2016, the Ellen MacArthur Foundation quantified that US$80 billion to $120 billion worth of plastic packaging was lost from the global economy each year due to the packaging not being collected for recycling. A year earlier, another baseline quantification determined that 8 million to 12 million tonnes of plastic leak into the oceans each year, with eight of the top 10 countries for plastic leakage being in Asia.

Whilst these are global statistics, it has quickly become apparent that Asia, as the world's largest consumer of plastic packaging and the largest contributor to marine leakage, is where bold vision and effective action is needed to stem this profound environmental damage and the loss of this valuable resource. This can only be addressed when there is a baseline from which to drive informed action and measure progress.

This report is the first to provide a systematic and comparative baseline of the flow of plastics packaging from production to end-states by studying PET bottles (one of the most recyclable forms of plastic packaging) in six countries in Southeast Asia. These six countries are Indonesia, the Philippines, Vietnam, Thailand, Myanmar, and Malaysia, which account for a total population of more than 600 million people, more than the population of all the European Union's 28 countries. Five of these six countries are among the top 10 global contributors to ocean plastic leakage. These six countries in Southeast Asia are, therefore, a focal point in global efforts to create the narrative for vision and action on changing the linear economy approach to plastic packaging.

This report is the first to identify the root causes of the challenging realities concerning post-consumer plastic packaging in Southeast Asia today and to provide a roadmap to transform the post-consumer PET landscape in Southeast Asia.

Detailed baseline data collection, analytical work and frequent interactions with stakeholders across the plastics value chain and experts throughout Southeast Asia and globally, revealed **five key findings and five recommended priority actions** to accelerate the circular economy for PET bottles in Southeast Asia.

FIVE KEY FINDINGS

1

In the six countries studied, the average Collected-for-recycling rate for PET bottles is 54% at the city level.

This baseline research (2018) shows that the average collected-for-recycling rate for PET bottles in nine key cities in Southeast Asia is 54%. The average landfill rate is 36%, and environmental leakage rate is 10%. There is a wide variation in these rates across the cities.

Extrapolating this information to the country level, the estimated average collected-for-recycling rate across the six countries studied is 26%, with another 26% going to landfills and the remaining 48% leaking into the environment. Comparing across the six countries, cities in countries with lower GDP per capita have higher collected-for-recycling rates than the cities in countries with higher GDP per capita.

2

The PET bottles that do not get recycled represent a loss in value of US$199 million.

Across the six Southeast Asian countries studied, a cumulative US$199 million worth of PET bottles is leaking into the environment or ending up in landfills each year.

3

The informal sector is responsible for 97% of the PET bottles collected for recycling in the cities studied.

The informal sector is the backbone of collection. The informal sector's significance rises out of the limited success of formal collection and recycling systems implemented to date in Southeast Asia.

4

Six underlying reasons account for the low Collected-for-recycling rates for PET bottles.

There are six underlying reasons for the low collected-for-recycling rates for PET in Southeast Asia:

1. Prices of post-consumer material are insufficient to drive informal sector collection;
2. Lack of value creation mechanisms and developed local end markets;
3. Current packaging design hinders value creation;
4. Poor waste collection coverage leads to material leakage;
5. Lack of source separation and separate collection leads to poor access to recyclable material;
6. Existing collection efforts in Southeast Asia have typically been short-term.

5

Status quo will result in a drop in PET bottle Collected-for-recycling rates.

Continued reliance on only the informal sector is expected to reduce collected-for-recycling rates in the future. This is because as cities and countries develop, the average cost of living increases, thus collecting and selling PET becomes very challenging in the face of rising standards of living and the informal sector, therefore, moves onto other trades and jobs.

It is expected that Asia Pacific will be the fastest global growth market for PET. The consumption of PET bottles is projected to almost double between 2018 and 2030 in the six Southeast Asian countries studied, from 886,000 tonnes to 1.52 million tonnes. Thus, even if the informal sector remained the same size and collected the same quantities per person, the collected-for-recycling rates would almost halve purely due to the doubling of market input.

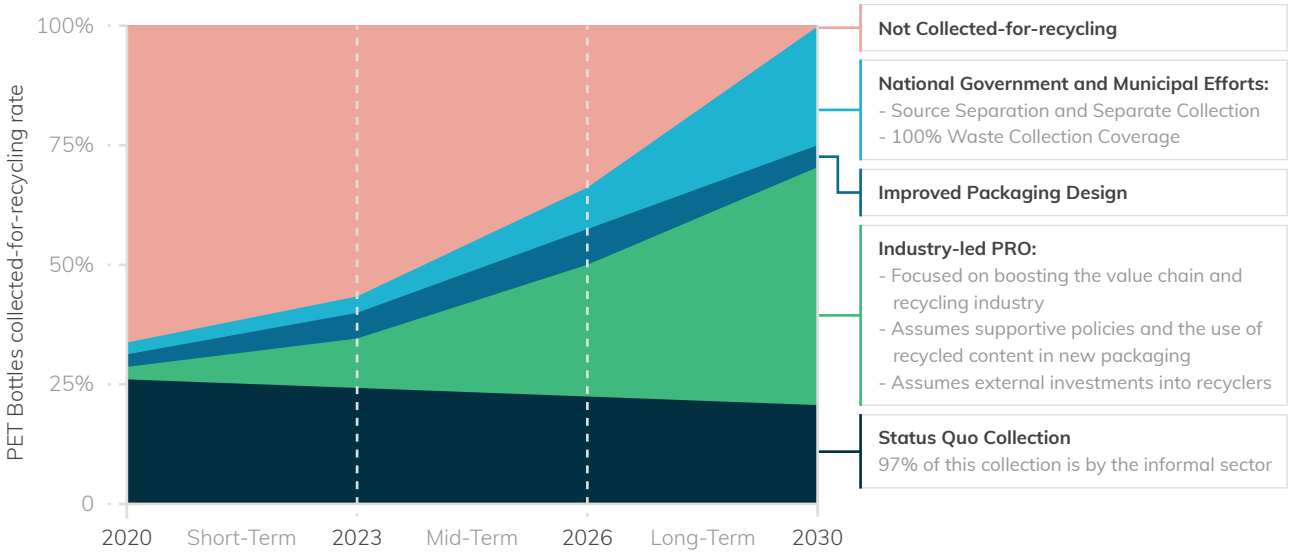
RECOMMENDED PRIORITY ACTIONS

The most effective response to the challenges currently facing the post-consumer PET landscape in Southeast Asia is one that effectively and continually boosts the collection and recycling operations currently in place. For the first time, a series of priority actions have been identified to transform the post-consumer PET landscape in Southeast Asia.

These priority actions and the related key actors are as follows:

Action	*Key actors*
Industry-led PRO focused on boosting the value chain, coupled with supporting policies and investments.	- Packaging and consumer goods industries as a collective effort - Supported by national governments, recyclers, investors, and funding institutions
Improved packaging design to improve the economics of recyclability by phasing out coloured PET and PVC labels, and using easier-to-remove label formats.	- Packaging and consumer goods industries - Individual company efforts in the short-term, collective industry effort in the mid- and long-term
National government and municipal efforts to impact source separation and separate collection, national recycling targets, and reach 100% waste collection coverage.	- National governments and municipalities

FIGURE 1: ACHIEVING A 100% COLLECTED-FOR-RECYCLING RATE OF PET BOTTLES IN SOUTHEAST ASIA



Source: GA Circular Analysis (see Appendix G for details).

ACTIONS OF EACH KEY STAKEHOLDER

BY PACKAGING AND CONSUMER GOODS INDUSTRIES

Phase out coloured PET and the phase out of PVC in PET bottles to improve the economics of PET bottle recycling and ensure that the PET bottles that are collected for recycling can be used for a wider variety of end-use applications. Coloured PET bottles are a major challenge to the PET recycling value chain as the added pigments contaminate the recycling process. Colouring PET bottles reduces its value in the Southeast Asian recycling market by an average of US$84 per tonne, with the total price differential ranging between US$21-$172 per tonne. On average, 15.4% of PET in the six Southeast Asian countries studied is coloured PET. A total of 128,161 tonnes per year of coloured PET bottles entered the market across the six Southeast Asian countries studied. Usage of PVC sleeves for PET bottles are also a major contaminant in PET bottle recycling, particularly in food-grade applications.

Take the best aspects of various tools under mandatory and voluntary EPR frameworks and run voluntary Packaging Recovery Organisations (PROs) in each country focused on boosting the value chain and the domestic recycling industry. The packaging and consumer goods industries are well placed to lead efforts to build the value chain through pulling material through the value chain and developing local end-use markets. It is recommended that a coalition of companies from the packaging and consumer goods industries set up a non-profit entity in the form of a Packaging Recovery Organisation (PRO) in each country. This research outlines the recommended industry-led voluntary PRO approach for Southeast Asian countries. It is informed by knowledge garnered from the more than 68 developed and developing countries and from the in-depth study of PROs in Mexico (ECOCE), South Africa (PETCO), Belgium (Fost Plus) and Japan (JCPRA).

RECYCLERS, INVESTORS AND FUNDING INSTITUTIONS

Accelerate investments in food-grade rPET production capacity within Southeast Asia to meet the anticipated 2030 demand. Current food-grade rPET production capacity in Southeast Asia is estimated to be between 10,000 and 30,000 tonnes per year. Several major multinational consumer goods companies have committed to using up to 50% rPET content in packaging by 2030. Assuming a conservatively lower 25% rPET content usage in PET packaging in 2030, demand of at least 380,000 tonnes of food-grade rPET across these six Southeast Asia countries is expected by 2030. Given that 20% of this demand can be supplied by adding post-consumer PET flakes during the process of making virgin PET, the remaining 80% (304,000 tonnes) will need to be achieved through an increase in the production capacity of food-grade rPET pellets. This is equivalent to at least 10 plants with a production output of 30,000 tonnes per year of rPET that need to be added by 2030 - i.e. one additional plant per year.

BY NATIONAL GOVERNMENTS AND MUNICIPALITIES

Develop and enact enabling legislation and policy to drive the circular economy. These policies would include those that assist in building the value chain, such as those governing the use of recycled content and standards for food-grade applications. This would also include those that push material through the value chain by enabling better material access, such as those enforcing source separation and separate collection. Before any EPR implementation, governments should also undertake a detailed study of different EPR tools, their advantages and disadvantages and their projected impact on the local product market, recycling markets and the informal sector. It is critical that any chosen EPR tools focus on boosting the value chain.

Review economic and administrative incentives for the development of a local recycling industry. Governments could consider provision of economic incentives to support a circular economy, e.g. tax incentives for producers which use a minimum of 30% recycled content in packaging, or levies for producers that use less than 30% recycled content.

Increase waste collection coverage and efficiency. Undertake sustained source separation and separate collection efforts, and increase waste collection coverage to 100%. Governments and municipalities need to recognise their critical role in making post-consumer material accessible and of higher value for recycling, and that any separation efforts will take time to scale from city level to country level.

Through these actions by key enablers, an accelerated circular economy for post-consumer PET bottles in Southeast Asia is 100% achievable.