*Version 1 - October 2023*

SUMMARY OF THE

# PLASTIC PACKAGING RECOVERY OPPORTUNITIES IN THE ANZPAC REGION

## REPORT

ANZPAC PLASTICS PACT | PLASTICS PACT

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# INTRODUCTION

**The ANZPAC Plastics Pact (ANZPAC) has a shared vision of a circular economy for plastic, where plastic never becomes waste or pollution.**

Its Members are working collaboratively to implement solutions tailored to Australia, New Zealand and the Pacific Islands region.

**This document provides a summary of the Plastic Packaging Recovery Opportunities in the ANZPAC Region report published by ANZPAC.**

**The full report focuses on the analysis of a regional pathway to plastic circularity by 2025 by:**

- looking at the performance against each of ANZPAC's 2025 Regional Plastics Targets (the Targets) in 2019-20; and
- including a scenario analysis to estimate the impact of four different interventions on progress towards these Targets.

The findings of the assessment provide new insights to inform future strategies for improving plastic packaging management in the ANZPAC region.

# KEY FINDINGS

## 1

**Most plastic packaging** coming into countries in the ANZPAC region, approximately

**63%**,

is either **not designed for recovery** or **does not have a recovery pathway**.

**Plastic packaging design for the ANZPAC region needs to shift focus on upstream solutions such as elimination and reuse.**

## 2

Losses during the recovery pathway were significant across all countries in the region, with over

**83.4%**

**of used plastic packaging becoming litter, lost to landfill or poorly managed including burned, buried or lost into the environment.**

**Focus on effective collection and recycling is relevant across all ANZPAC countries to increase recycling rates.**

## 3

Of scenarios modelled, chemical recycling of soft plastic could lead to a large increase in the recovery rate by 2025, from

**16.6% TO 20.3%**

**Innovative accelerator projects can test effectiveness, viability and impact of such solutions.**

## 4

Extended producer responsibility scheme such as container deposit schemes (CDS) across Pacific Island Countries (PICs) would see significant improvements in recovery performance.

**CDS is a key recovery pathway for plastic packaging for many Pacific Island countries.**

## Plastic packaging

# DISTRIBUTION & CONSUMPTION

**Approximately 1.3 million tonnes of plastic packaging were placed on the market (PoM),** with approximately 86% of this placed on the Australian market. Consumption per person varied significantly, from **44 kg per person in Australia, down to 10 kg in Solomon Islands and Vanuatu** (Table 1).

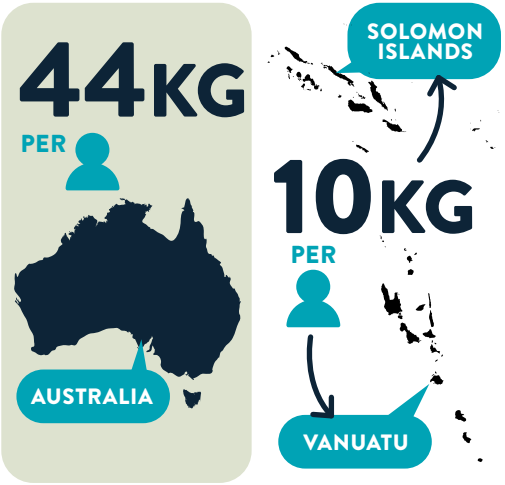



**Table 1** – Plastic packaging PoM by country in 2019-20 – total and per person.

| Country | Total plastics packaging PoM (tonnes) | Plastics packaging PoM per capita (kilograms) |
|---|---|---|
| Australia | 1,123,800 | 44 |
| New Zealand | 146,200 | 30 |
| Fiji | 19,400 | 20 |
| Western Samoa | 3,500 | 17 |
| Solomon Islands | 6,700 | 10 |
| Tonga | 2,100 | 19 |
| Vanuatu | 3,100 | 10 |
| TOTAL | 1,304,800 | 40 |

# RECYCLING SYSTEM PERFORMANCE

## Material flows of plastic packaging through the recycling system

Material flow analysis highlights losses at key stages of the packaging lifecycle (Figure 1). Of the 1.3 million tonnes of plastic packaging PoM in the region, 63% is considered not recyclable.[1] The other 487,000 tonnes of recyclable packaging achieved a collection rate for recycling of 50%, but approximately 13% of the collected plastics was lost in sorting and recycling processes. The end result was 216,000 tonnes of used plastic packaging recovered across the ANZPAC region in 2019-20.

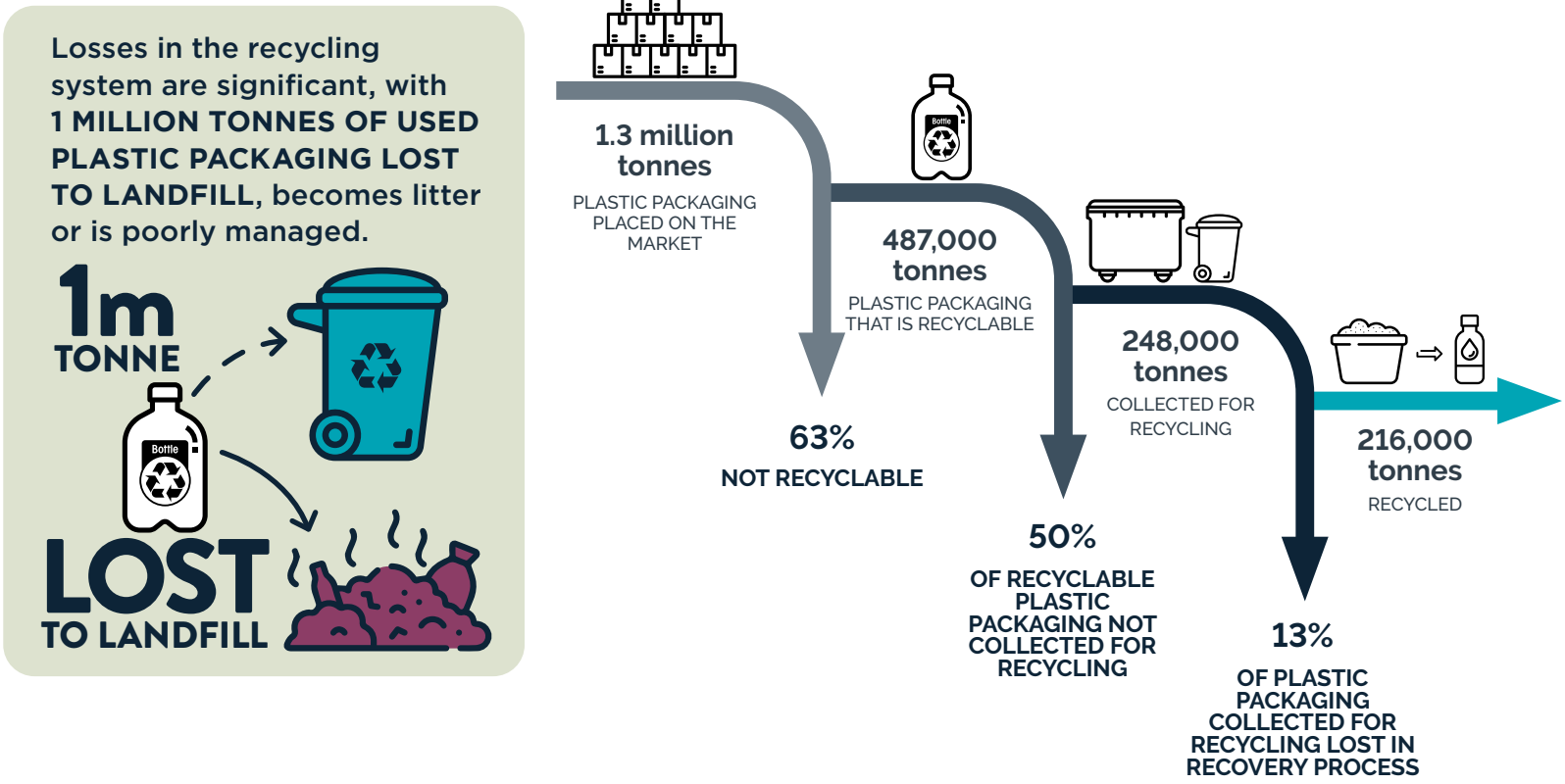



**Figure 1:** Plastic packaging losses through the packaging collection and recovery system for the entire ANZPAC region in 2019-20.

[1] This analysis has used the recyclability classification from the Ellen Macarthur Foundation (EMF), which specifies that packaging is recyclable if there is a packaging collection and recycling system available and at scale and achieving a post-consumer recovery rate of 30%.

# Plastic packaging recovery

**The estimated 216,000 tonnes of used plastic packaging recovered in the region in 2019-20 represented a recovery rate of almost 17%, but with significant variations between countries** (Table 2). New Zealand had the highest recovery rate at 26%. Fiji collected only polyethylene terephthalate (PET), high density polyethylene (HDPE), and low density polyethylene (LDPE) for recycling, and only PET packaging was recycled in Western Samoa. No plastic packaging was collected for recycling in the Solomon Islands, Tonga or Vanuatu.

**Table 2** – Plastic packaging recovery rate by country in 2019-20.

| Country | Recovery rate |
|---|---|
| Australia | 16% |
| New Zealand | 26% |
| Fiji | <1% |
| Western Samoa | <1% |
| Solomon Islands | 0.0% |
| Tonga | 0.0% |
| Vanuatu | 0.0% |
| TOTAL | 17% |

**PET PACKAGING** achieved the highest recovery rates in the region **42%** and **LDPE the lowest (4%)**.

There were large differences in recovery by packaging format, with **26%** **RIGID PACKAGING** recovered compared to only **4% of flexible packaging**.

The only recycling of flexible plastic packaging outside New Zealand and Australia was in **Fiji**, which achieved a recovery rate of **5%** **for LARGE FLEXIBLE PLASTIC PACKAGING** but no recycling of smaller flexible formats.

# Performance against the 2025 REGIONAL PLASTICS TARGETS

**In this analysis, metrics were used to evaluate recovery system performance against the 2025 ANZPAC Regional Targets. Table 3 summarises estimated performance against these Targets.**

**Table 3** – Performance against ANZPAC's 2025 Regional Plastics Targets 2019-20.*

| Country | **TARGET 1:** Eliminate unnecessary and problematic plastic packaging (% of PoM) | **TARGET 2:** 100% of plastic packaging to be reusable, recyclable or compostable (% of PoM) | **TARGET 3:** Increase plastic packaging recovery rate by 25% for each geography (% of PoM) | **TARGET 4:** Average 25% recycled content in new packaging (% of PoM) |
|---|---|---|---|---|
| Australia | 43% | 36% | 16% | 4% |
| New Zealand | 35% | 55% | 26% | 6% |
| Fiji | 57% | 19% | <1% | 4% |
| Western Samoa | 51% | 9% | <1% | 3% |
| Solomon Islands | 52% | 18% | 0% | 5% |
| Tonga | 57% | 19% | 0% | 4% |
| Vanuatu | 37% | 23% | 0% | 6% |
| ANZPAC | 42% | 37% | 17% | 4% |

*Note: Uncertainties on country level metrics are found in Appendix A7 in the full report 'Plastic Packaging Recovery Opportunities in the ANZPAC Region'.

## TARGET 1:

**ELIMINATE unnecessary and problematic plastic packaging** through redesign, innovation and alternative (reuse) delivery models.

**APPROXIMATELY 42%** of plastic packaging PoM in the ANZPAC region was considered **UNNECESSARY AND PROBLEMATIC**, meaning there is a significant gap to the Target of eliminating these materials.

Plastic packaging formats considered problematic and unnecessary were single-use rigid polyvinyl chloride (PVC), rigid polystyrene (PS) and expanded polystyrene (EPS), lightweight LDPE/HDPE shopping bags, and oxo-degradable plastic packaging.

The proportion of plastic packaging PoM that is considered unnecessary and problematic was generally highest for the PICs.

An estimate 1% of HDPE and 61% of LDPE was considered and/or unnecesary corresponding to single-use/light-weight shopping bags and oxo-degradable packaging types made of these materials.

From a format perspective, 61% of flexible packaging, and 50% of rigid formats were problematic.

## TARGET 2:

**100% of plastic packaging to be reusable**, recyclable or compostable packaging by 2025.

**APPROXIMATELY 37%** of plastic packaging was considered **RECYCLABLE** — significantly less than the 100% Target for 2025.

This proportion was lowest in the PICs owing to a general lack of recovery systems in these countries, and the high proportion of flexible packaging PoM. New Zealand had the best performance of the ANZPAC countries, with approximately 55% of plastic packaging placed on the market deemed recyclable according to the definition used by the Ellen Macarthur Foundation (EMF).[1]

## TARGET 3:

**INCREASE plastic packaging collected and effectively recycled by 25%** for each geography within the ANZPAC region.

### AN ESTIMATED 17% of all plastic packaging PoM in the ANZPAC region was recycled in 2019-20.

Across the ANZPAC region, the recycling rate was almost 17%, but with significant variations between countries. PICs had the lowest recycling rate at less than 1% and New Zealand the highest at 26%.

The recycling rates calculated for this analysis cannot be used to directly measure performance against Target 3, which stipulates an increase in the quantity of plastic packaging recycled by 25%. The data generated and the approach used in this report can, however, serve as a baseline for future analysis.

## TARGET 4:

**AVERAGE of 25% recycled content in plastic packaging** across the region.

### RECYCLED CONTENT made up approximately 4% of total plastic packaging PoM significantly less than the Target of 25%.

From a materials perspective, PET packaging had the highest proportion of recycled content at 13% while HDPE, polypropylene (PP) and LDPE packaging were lower at 4%. From a format perspective, bottles had the highest rate of recycled content at approximately 8%.

Investment in recycled plastic production by manufacturers and demand creation by brands is critical to increasing the percentage of recycled content in plastic packaging.

# SCENARIO ANALYSIS OF SYSTEM INTERVENTIONS

**ANZPAC plastic packaging flows in 2026-27 were projected and used to evaluate the potential impact of various system interventions on achievement of the 2025 Regional Plastics Targets. The potential impact of these interventions was evaluated under five scenarios:**

## Scenario 1:
BUSINESS AS USUAL 2026-27.

**This scenario modelled ANZPAC packaging material flows for 2026-27 without any further interventions. Population projections were combined with per-capita generation rates from 2019-20 to estimate 2026-27 packaging consumption. Packaging composition was assumed to be unchanged.**

The business-as-usual (BAU) scenario provides the performance baseline for all other scenarios. Approximately 1.4 million tonnes of plastic packaging are projected to be PoM in the ANZPAC region in 2026-27. This is an increase of approximately 10% compared to 2019-20, consistent with the projected increase in total population in the region.

## Scenario 2:
STANDARDISED REGIONAL MATERIAL BANS 2026-27.

**This scenario evaluates the impact of standard plastic packaging material bans across the entire ANZPAC region. The following materials and items are assumed to be banned: lightweight and heavy weight shopping bags, EPS, rigid PS, rigid PVC and oxo-degradable plastics.**

**Impact on Target 1 and 2:** Material bans and substitutions will impact on the proportion of packaging PoM that is problematic/unnecessary, and the proportion that is recyclable. The proportion of problematic and unnecessary plastic packaging is estimated to fall from 42% (BAU) to 35% under this scenario. This reduction was greater in PICs than in Australia and New Zealand.

**Impact on Target 3:** Material bans are estimated to reduce overall packaging PoM by approximately 8%, leading to a very small increase in plastic packaging recovery from 16.6% (BAU) to 17.1% under this scenario.

## Scenario 3:
CDS IMPLEMENTATION IN THE ANZPAC REGION.

**This scenario models the potential impact of a container deposit scheme (CDS) being implemented across the ANZPAC region and including both HDPE and PET beverage bottles.**

**Impact on Target 3:** Under this scenario the PICs would see significant improvement in recovery performance from 0.1 to 3.81% with CDS being a key recycling pathway for plastic packaging for most of these countries. CDS implementation across the region is estimated to lead to a small (0.5%) increase in plastic packaging recovery overall from 16.6% (BAU) to 17.1% under this scenario.

## Scenario 4:
ADVANCED RECOVERY OF FLEXIBLE PLASTICS.

**This scenario models the potential impact of advanced recovery* facilities being available in the region for flexible plastics.**

**Impact on Target 2:** Under this scenario there would be a significant improvement in the proportion of plastic packaging that is recyclable, increasing to 64% of total plastic packaging compared to 37% under BAU.

**Impact on Target 3:** Advanced recycling of soft plastics could lead to a large increase in the recovery rate to 20.3%, with transport and logistics opportunities to be investigated to realise this benefit.

## Scenario 5:
COMBINED SCENARIO.

**This scenario combines assumptions from those above to evaluate the overall potential impact on ANZPAC plastic packaging recovery, assuming all interventions are implemented.**

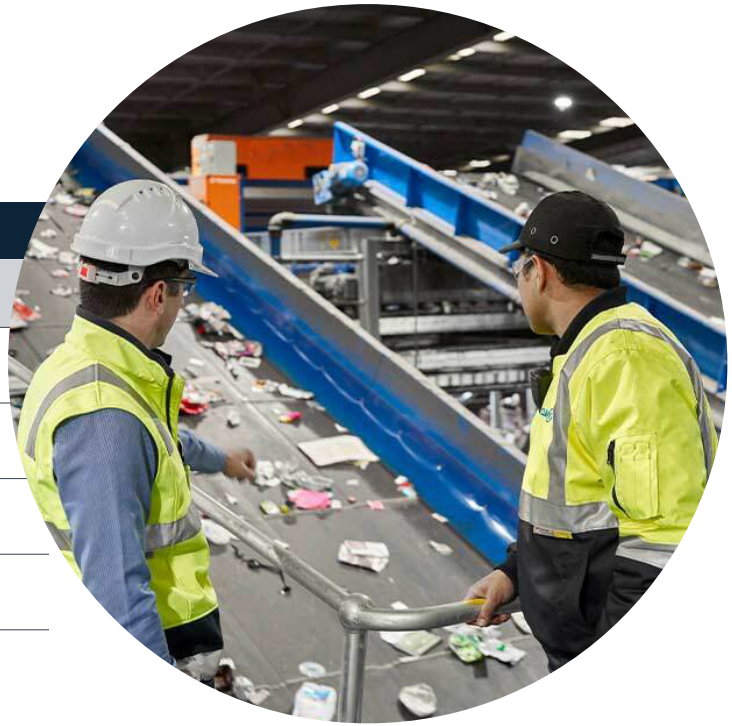
**Impact on Target 3:** This scenario had the largest impact on the overall plastic packaging recovery rate, increasing it from 16.6% (BAU) to 21.2%.

*The chemical recycling of plastics, also called advanced or feedstock recycling, is the chemical processing of post-consumer waste plastics to mixtures of chemicals or raw materials to be made into new materials.

# Key results of the scenario analysis

**Table 4** – Recovery rate for plastic packaging compared to BAU for each scenario.

| Scenario | Recovery rate | %-change compared to baseline |
|---|---|---|
| **Scenario 1:** Business as usual | 16.6% | n/a |
| **Scenario 2:** Material ban scenario | 17.1% | +0.5% |
| **Scenario 3:** CDS expansion | 17.1% | +0.5% |
| **Scenario 4:** Advanced flexible plastics recycling | 20.3% | +3.7% |
| **Scenario 5:** Combined scenarios 2, 3 and 4 | 21.2% | +4.6% |



The roll out of CDS in New Zealand and the PICs would see significant improvements in recovery performance. PICs would see the largest increase in the overall recovery rate from 0.1 to 3.81% with CDS being a key recycling pathway for plastic packaging for most PICs.

If supported by enhanced collection systems and logistics efficiencies, the availability of advanced plastics recovery facilities to provide an end market for flexible plastics could have a large impact on overall ANZPAC recovery performance.

The analysis highlights the importance of interventions to increase collection of flexible plastics to provide feedstock for advanced facilities currently being trialled or developed in the region.

# RECOMMENDATIONS

## Applying circular plastic packaging design principles

The plastic packaging system performance against ANZPAC's 2025 Regional Plastic Targets clearly showed that innovation, redesign, and alternative use models are necessary to progress in recovery of plastic packaging. Focus needs to be on reduction of packaging, viable reuse models and systems, and recyclability in practice and at scale.

## Improving collection rates

To increase recycling of plastic packaging placed on the market in the ANZPAC region, improved collection is needed across the region. This could be achieved through such activities as:

- separation of recyclables and non-recyclables at households and businesses,
- extending CDS to NZ and PICs,
- establishing more widespread collection systems in PICs for all formats,
- expanding collection systems for flexible formats in Australia and New Zealand, and/or
- applying recovery models that are geographically relevant in remote and regional communities.

## Implementing system interventions by 2025

To move towards ANZPAC's 2025 Regional Plastic Targets, system changes are required to close the gaps in the Target performance. The two system interventions with the highest impact are introduction of advanced recycling technology for soft plastic recovery and CDS extension.

- CDS implementation in New Zealand and PICs will significantly increase recovery rates of plastic packaging and improve source separation of rigid plastic packaging.
- Innovative chemical recycling solutions should be investigated to identify opportunities for long term recovery of soft plastics.

## FULL REPORT

The full report **PLASTIC PACKAGING RECOVERY OPPORTUNITIES IN THE ANZPAC REGION** is available on the **ANZPAC website.**

## FURTHER INFORMATION

*anzpacplasticspact.org.au*




### CITATION

ANZPAC, 2023. *PLASTIC PACKAGING RECOVERY OPPORTUNITIES IN THE ANZPAC REGION*, full report prepared by Institute for Sustainable Futures, University of Technology Sydney on behalf of the Australia, New Zealand, and Pacific Islands Plastics Pact (ANZPAC), October 2023.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