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Secretariat of the Pacific Regional Environment Programme

PacWastePlus
PACIFIC WASTE MANAGEMENT

This initiative is supported by **PacWastePlus**-a 72 month project funded by the European Union (**EU**) and implemented by the Secretariat of the Pacific Regional Environment Programme (**SPREP**) **to sustainably and cost effectively improve regional management of waste and pollution.**

Recycling Market
SUMMARY BOOKLET

November 2021

This booklet is intended as an entry point for Pacific Island Countries (PICs) to improve waste export activities and enable access to international markets. It includes a summary of six different waste types, with more details available in the *Recycling Market Research Report.*

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Our vision: A resilient Pacific environment sustaining our livelihoods and natural heritage in harmony with our cultures.

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PacWastePlus Programme

The Pacific – European Union (EU) Waste Management Programme, PacWastePlus, is a 72-month programme funded by the EU and implemented by the Secretariat of the Pacific Regional Environment Programme (SPREP) to improve regional management of waste and pollution sustainably and cost-effectively.

About PacWastePlus

The impact of waste and pollution is taking its toll on the health of communities, degrading natural ecosystems, threatening food security, impeding resilience to climate change, and adversely impacting social and economic development of countries in the region. The PacWastePlus programme will generate improved economic, social, health, and environmental benefits by enhancing existing activities and building capacity and sustainability into waste management practices for all participating countries.

Countries participating in the PacWastePlus programme are: Cook Islands, Democratic Republic of Timor-Leste, Federated States of Micronesia, Fiji, Kiribati, Nauru, Niue, Palau, Papua New Guinea, Republic of Marshall Islands, Samoa, Solomon Islands, Tonga, Tuvalu, Vanuatu.

KEY OBJECTIVES

Outcomes & Key Result Areas

The overall objective of PacWastePlus is "to generate improved economic, social, health and environmental benefits arising from stronger regional economic integration and the sustainable management of natural resources and the environment".

The specific objective is "to ensure the safe and sustainable management of waste with due regard for the conservation of biodiversity, health and wellbeing of Pacific Island communities and climate change mitigation and adaptation requirements".

Key Result Areas

- Improved data collection, information sharing, and education awareness
- Policy & Regulation - Policies and regulatory frameworks developed and implemented.
- Best Practices - Enhanced private sector engagement and infrastructure development implemented
- Human Capacity - Enhanced human capacity

Learn more about the PacWastePlus programme by visiting

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PACIFIC WASTE MANAGEMENT

https://pacwasteplus.org/

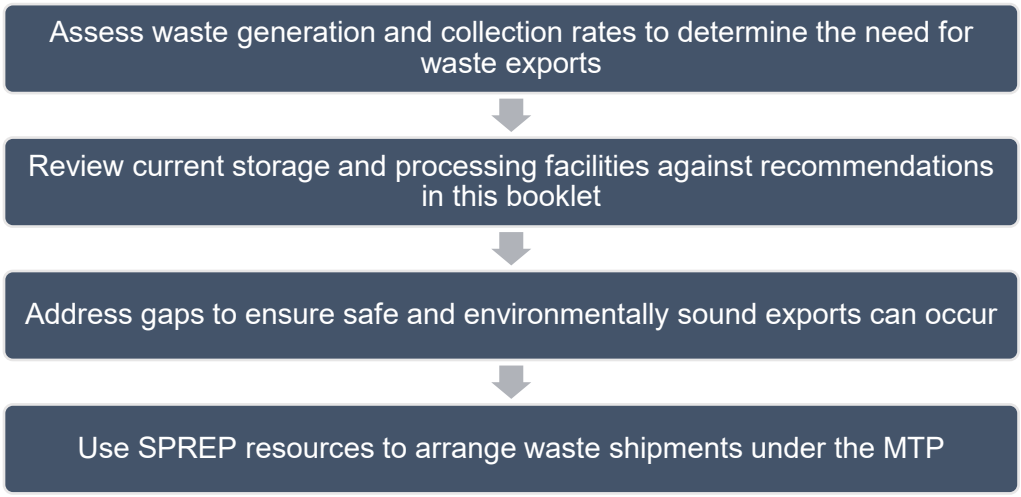
Introduction

Small island nations face a host of logistic and financial barriers in attempts to increase local recycling rates. The exportation of recycled material presents a range of benefits for nations with the inability to dispose or reuse waste in an environmentally beneficial manner. This could be due to a shortage of landfill capacity on-island, the risk of hazardous chemical pollution or the lack of primary industries in the Pacific region. For some waste streams, there is a potential for commodification if export is achieved efficiently.

This booklet is intended as an entry point for Pacific Island Countries (PICs) to improve waste export activities and enable access to international markets. It includes a summary of six different waste types, with more details available in the *Recycling Market Research Report*. PICs currently collect and export a range of commodifiable waste streams through a mixture of private and public operations, although there are opportunities to increase the efficacy and frequency of waste shipments.

Resources in this study should be consulted in conjunction with the SPREP *Moana Taka Partnership Guide* and PacWastePlus website. The Moana Taka Partnership (MTP) is a Memorandum of Understanding between the Swire Shipping Pte. Ltd. and SPREP that has been developed to address critical waste management issues in the Pacific Islands. The agreement supplies free container backfilling arrangements for non-commercial waste materials destined for international recycling.

PIC policymakers and recyclers are recommended to follow the process outlined in the figure below to achieve the best outcomes for waste exports.



Estimated shipment values have been included for each waste type as guidance for the anticipated cost or profit from exporting waste material. Some shipments are considered non-commercial and are supported by the MTP, others are potentially commercial (such as used batteries, aluminium cans, and single stream plastics) and would require shipment costs to be covered by the exporter.

These costs will vary based on transport requirements for the domestic consolidation of materials and variations to international freight rates.

Governments are also advised to make additional consideration around sustainable financial mechanisms, such as import levies, Advanced Recovery/ Extended Importer Responsibility Schemes, or international aid to cover the cost of material exports or fund infrastructure improvements. SPREP resources, such as the *Advanced Recovery Fee & Deposit Systems Factsheet* can help inform these decisions.

A key consideration prior to waste export is the relevance of multilateral environmental agreements (MEAs), which are summarised below.

MEA	Convention Scope
Basel Conv. (BC)	Regulates the transboundary movement of hazardous chemicals through requirements for tracking documentation and prior informed consent.
Waigani Conv. (WC)	The regional implementation of the Basel Convention for the Pacific region.
Rotterdam Conv. (RC)	Promotes shared responsibility in the international trade of hazardous chemicals by establishing measures such as standardised labelling and safe handling protocol. Exporting countries are obliged to ensure compliancy within their jurisdiction.
Stockholm Conv. (SC)	Eliminates the production, import and export of chemicals containing Persistent Organic Pollutants (POPs) listed in Annex A with additional measures to reduce the unintentional release of Annex C chemicals.
Montreal Protocol (MP)	Controls the generation and release of ozone depleting substances.

Exporters will need to engage with reputable recyclers at recommended export markets to gain prior consent agreements and follow labelling and safety requirements legislated by both export and import countries.

The table below summarises the relevance of MEAs to each waste type considered in this study.

Waste Type	BC and WC	RC	SC	MP
Asbestos	✓	✓	✗	✗
Waste oil*	✓	✓	✗	✗
Used batteries	✓	✗	✗	✗
Pesticides and industrial chemicals†	✓	✓	✓	✓
Whole or shredded tyres	✗	✗	✗	✗
E-waste	✓	✗	✗	✗
Plastic	✓	✗	✗	✗
Metals§	✓	✗	✗	✓

** Only leaded fuels regulated by the RC.*

† See MEA Annexes to determine which substances are regulated

§ Only residuals from de-polluting of white goods and ELVs

Asbestos

Asbestos is a naturally occurring fibrous silicate mineral used in the manufacture of building materials due to its good insulating and fireproofing properties. However, all forms of asbestos pose serious health risks if fibres are inhaled, including mesothelioma, asbestosis, and lung cancer.

Asbestos has been utilized in the Pacific region for many years in construction applications, with many PICs still importing asbestos containing materials.

Building demolitions and natural disasters have the potential to generate large volumes of friable asbestos materials which pose a severe risk to public health. Currently, asbestos is commonly stockpiled in an unmonitored and unregulated manner.

It is recommended that PICs work to decrease the size of existing asbestos stockpiles and enact controlled collection and storage systems to prevent public exposure. Export represents a sustainable asbestos management technique and is considered favourable in comparison to stockpiling and informal dumping.

Focus Area	Asbestos Relevant
Recommended export destinations	Australian or New Zealand licenced asbestos landfills.
Estimated shipment value per container	USD$ -4,480
Best practice storage and pre-processing	• Contained in new heavy duty polyethylene bags or sheeting (minimum 200-micron thickness). • Adhesive tape used to tightly secure bags and sheets. • Material stored in a solid waste drum, skip or shipping container ensuring that warning labels are placed on the exterior of each receptacle.
Safety considerations	• Airborne asbestos fibres are highly hazardous and require PPE and training prior to handling (disposable coveralls, gloves, safety footwear and respiratory protective equipment). • Labelling and consent requirements aligned with MEAs. • Controlled wetting of the asbestos waste should be carried out to minimise asbestos dust emissions.
Infrastructure and technology	• Hazardous waste landfills conforming to US EPA standards would be required for safe on-island disposal, hence adequate resources should be made available to facilitate export. • Alternative non-hazardous building materials should be investigated to decrease asbestos generation rates.

Hazardous Waste

Hazardous materials are vital to many aspects of modern life such as transportation, food production and healthcare practices. If the management and disposal of hazardous wastes are not properly managed, they can pose a range of risks to the environment and public health. This study has focused on the recycling of waste oils and used batteries.

Currently, hazardous materials in PICs are rarely separated from general waste and are disposed of in landfills. This practice poses significant health risks to landfill staff and waste pickers, as well as increases the risk of environmental contamination.

Open burning is also commonly practiced, which contributes to the generation of atmospheric persistent organic pollutants and ozone depleting substances.

Some hazardous wastes, such as used lead-acid batteries, have the potential for commodification in international recycling markets. The export of these materials could provide revenue streams to fund other PIC waste management programs. Furthermore, export reduces the environmental and public health risks that current hazardous waste disposal systems cause.

Focus Area	Hazardous Waste Relevant
Recommended export destinations	• Waste oil: Fiji, Indonesia, Nauru, and Philippines • Used batteries: Korea, Philippines, and Hong Kong
Estimated shipment value per container	• Waste oil: USD$ 1,510 • Used batteries: USD$ 1,500 independent of MTP
Best practice storage and pre-processing	• All hazardous waste stored inside dedicated receptacles (such as acid resistant containers, pallets, or waste oil drums) on an impermeable surface. Use bunding where possible to reduce spillage. • Batteries should be stacked upright with covered terminals and sealed caps. When shipped, batteries should be arranged on pallets, no more than 3 layers high with corrugated cardboard placed between each layer. • Conduct regular inspections of tanks and casings for damage or leaks. Inspections should also monitor oil contaminants for quality assurance.
Safety considerations	• Hazardous wastes are often corrosive, toxic, or carcinogenic and require PPE and training prior to handling (acid-resistant clothing, safety footwear, gloves, face, and eye protection). • Labelling and consent requirements aligned with MEAs. • Chemical spills kits at storage and transport locations.
Infrastructure and technology	• Storage and recycling facilities should possess impermeable floors, stormwater runoff management, spill kits, PPE, staff training systems and adequate resources to facilitate export. • On-island waste oil management options include reuse as fuel for industrial burners, waste oil electricity generators or mobile processing units. Sustainable financing mechanisms can be used to fund collection and storage costs.

Tyres

The recycling of end-of-life tyres (ELTs) represent opportunities to substitute the use of virgin construction materials or fossil fuels to help conserve natural resources. Currently, financial barriers commonly prevent the responsible management of ELTs. This study has included discussion on the recycling of whole and shredded ELTs.

PICs are estimated to generate 7,000 tonnes per year of ELTs, with large stockpiles currently located on many islands. The risk of uncontrolled fires and disease vector habitats for mosquitoes makes these stockpiles a risk to public health and the environment. Open air burning is still a common occurrence, which results in toxic atmospheric pollutants.

There exist opportunities to utilize baled and shredded tyres in PIC engineering applications, such as road embankments or landfill drainage. The export of shredded tyres as tyre derived fuel (TDF) can replace fossil fuel feedstocks in the industrial production of cement clinker or pyrolysis oils. Care must be taken to select licensed and regulated disposal options for TDF with sufficient emission controls and environmental standards.

Focus Area	Tyres Relevant
Recommended export destinations	Malaysia and Japan
Estimated shipment value per container	• Baled ELTs: USD$ -230 • Shredded ELTs: USD$ 530
Best practice storage and pre-processing	• Tyres should be sorted and stored in piles with maximum dimensions of 6m (w) x 20m (l) x 3m (h). Buffer distances between buildings, firebreaks and ignition controls should be implemented at storage sites. • Piles should be covered with impermeable barriers to minimize disease vectors. • Tyres requiring disposal can be prepared for efficient transport through bailing or shredding.
Safety considerations	• Firefighting equipment at all storage and transport locations. • Quarantine and disease vector controls required if tyres are stored incorrectly and allowed to accumulate water. • If tyres are processed through baling or shredding, appropriate work health and safety measures must be in place.
Infrastructure and technology	• Baled tyres can be applied in civil engineering projects such as embankments and road foundations. • Shredded tyres can be used as cement clinker feedstocks or repurposed as drainage layering for landfills.

E-Waste

As regional access to power, telecommunications, health, and educational services grow, so too does the annual generation rate of e-waste material. Although due to the small and isolated nature of island e-waste generation, there exist logistical and commercial barriers to large scale e-waste recycling programs.

Regional e-waste management practices commonly include repair, cannibalisation of spare parts, dismantling, exportation, or disposal along with general rubbish. The presence of hazardous substances such as heavy metals and persistent organic pollutants means that the unregulated management of e-waste can easily impact the health of recyclers, the public and the environment.

There exist opportunities to implement extender producer responsibility schemes to fund sustainable e-waste management programs. Dismantling provides employment opportunities for PICs and recovery options for precious metals and recyclable materials. Subsequent recycling stages involving metallurgical processes cannot be practically undertaken in PICs, hence exportation represents a viable disposal option for whole e-waste or residuals from dismantling.

Focus Area	E-waste Relevant
Recommended export destinations	Korea and Malaysia
Estimated shipment value per container	• Whole e-waste: USD$ 3,040 • Dismantled e-waste: USD$ -370
Best practice storage and pre-processing	• Storage areas should be sheltered, have an impermeable surface with sealed drained systems and appropriate ignition controls. • Hazardous components should be kept in dedicated labelled containers. • If e-waste is to be dismantled, compliance with local legislation and consent requirements must be consulted. Disposal arrangements must be in place for hazardous residuals.
Safety considerations	• Components and chemicals inside e-waste are highly hazardous and require PPE and training prior to dismantling (including coverall clothing, safety footwear, gloves, eye protection and dusk masks). Fugitive emissions controls should be in place. • Labelling and consent requirements aligned with MEAs. • Chemical spills kits at storage and transport locations.
Infrastructure and technology	• Manual separation, sorting and de-pollution activities provide potential employment opportunities, although require strict monitoring of health and safety procedures to avoid associated risks.

Plastics

Plastics persist in the environment across timescales longer than most other waste types. Marine plastic and microplastic pollution are becoming an increasing concern for PICs due to negative financial impacts to tourism and fishing-dependent economies, hazardous marine navigation conditions and the widespread environmental impacts to fragile coastal ecosystems. The responsible management and disposal of plastics in the region has the potential to decrease marine plastic generation rates while providing possible revenue streams through export.

On average, plastics represent the second largest component of PIC household waste behind organics. Many PICs have enacted import bans of certain single-use plastic to reduce generation rates. Some nations and states have successfully implemented container deposit schemes (CDS) to increase collection rates of high value PET and HDPE plastics.

Due to constraints to PIC landfill capacities, the financial and environmental benefits of exporting plastic waste represent an alternate disposal option. The sorting of plastics into single streams based on resin types require infrastructure and labour investments, although has the potential for higher financial returns in international recycling markets.

Focus Area	Plastics Relevant
Recommended export destinations	Philippines and Malaysia
Estimated shipment value per container	• Baled PET: USD$ 220 independent of MTP • Baled HDPE: USD$ 5,870 independent of MTP • Baled mixed plastics: USD$ 310
Best practice storage and pre-processing	• Plastics can be stockpiled in bins, skips or containers prior to export. Mixing of different plastic resins or environmental contamination should be prevented. • Mixed plastics should be sorted to separate high value fractions of PET and HDPE. • Plastics should be baled to increase transport efficiency.
Safety considerations	• Adequate work health and safety measures should be in place for the operation of baling equipment. • If plastics are contaminated or otherwise fall under regulation by the Basel Convention, they must align with labelling and consent requirements.
Infrastructure and technology	• Balers should be implemented at collection points to increase expected revenue and market acceptance. • Additional shredded or pelletising technologies should be considered for larger countries.

Metals

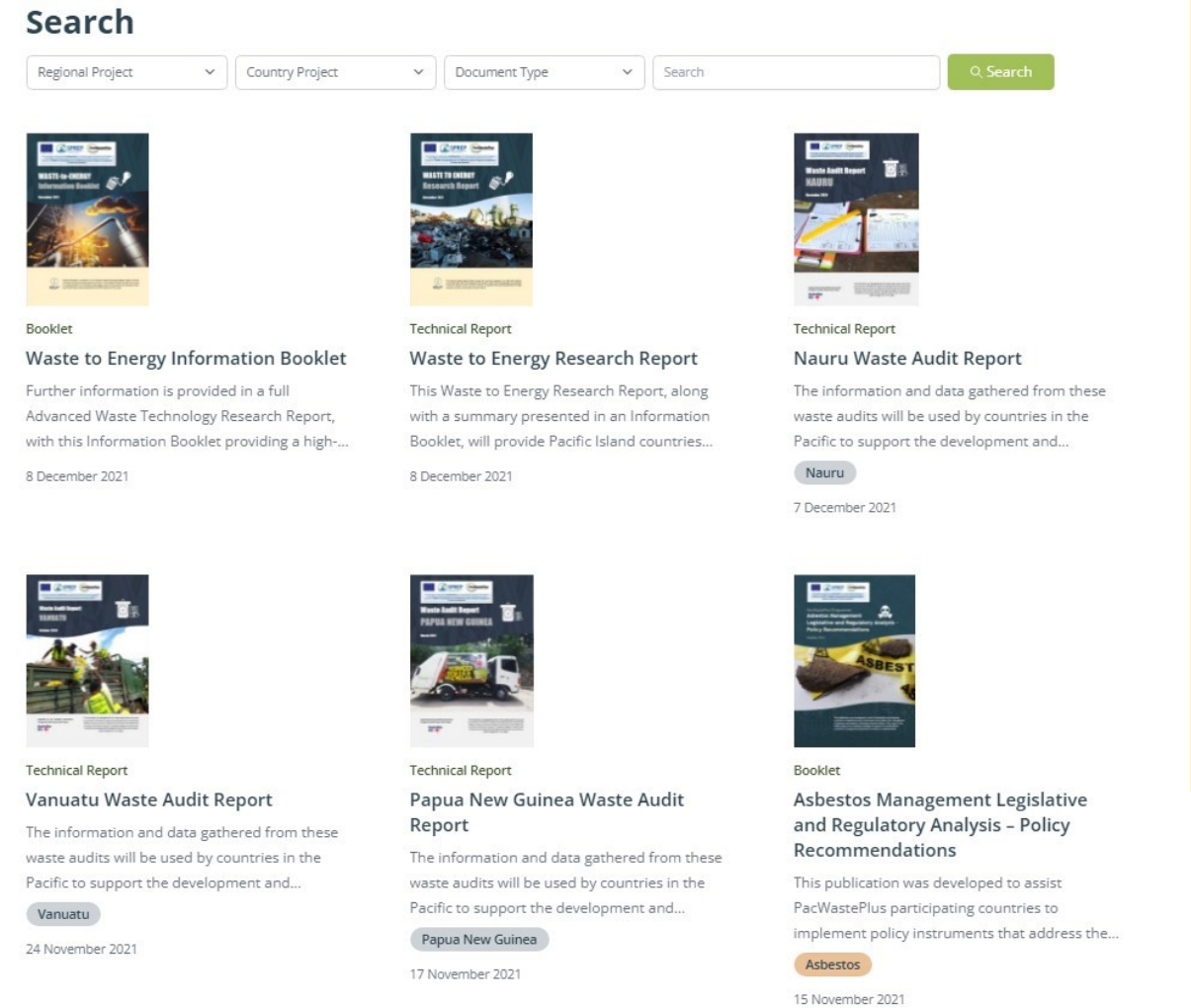
High value recyclable metals can be collected in many different forms such as aluminium cans, steel food containers, white goods, end-of-life vehicles (ELVs) and other scrap ferrous sources. The recycling of metals has the dual benefits of high market acceptance and low regulatory controls during exportation.

Many private and public metal recycling operations are currently active in the Pacific region. Aluminium cans are commonly collected, baled, and exported due to their high value. Although there are numerous opportunities to expand recycling activities to other sources of commodifiable metals.

Increasing the regulated de-pollution and recycling of white goods and ELVs can decrease existing material stockpiles while reducing the environmental contamination of ozone depleting refrigerants and other hazardous components.

Expanding the collection and export of other high value metals can provide additional revenue streams to fund other regional recycling programs.

Focus Area	Metals Relevant
Recommended export destinations	• Non-ferrous metal: Australia, New Zealand, Korea, Philippines, Hong Kong, and Malaysia • Ferrous metal: Australia, Hong Kong, and Korea
Estimated shipment value per container	• Baled aluminium cans: USD$ 10,490 independent of MTP • Baled ferrous scrap: USD$ 620 • De-polluted ELVs: USD$ -330
Best practice storage and pre-processing	• Metals can be stockpiled in bins, skips or containers prior to export. Mixing of different metal streams or environmental contamination should be prevented. • Mixed metals should be sorted to separate high value non-ferrous fractions. • Metals should be baled to increase transport efficiency.
Safety considerations	• Adequate work health and safety measures should be in place for the operation of baling equipment.
Infrastructure and technology	• Balers should be implemented at collection points to increase expected revenue and market acceptance. • ELV de-pollution should occur in processing facilities with impermeable floors, pollution runoff controls and vehicle hoists. Metal cutting tools can be used to increase recovery and mobile vehicle crushers/ heavy-duty balers can increase transport efficiency.



The PacWastePlus programme team is committed to producing meaningful and valuable publications and resources that provides guidance for improving waste management in the Pacific.

Browse our full library of in-depth resources and publications by visiting:

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