



## Introduction

The increasing presence of plastic marine debris in the South Pacific Ocean is focusing attention on strengthening recycling policies and systems in the region. Unique challenges associated with shipping commodities of low value over long distances to recycling markets, however, reduce the economic viability to do so. This country profile includes the current technologies, material flow, logistics, public policies, institutional framework, financial mechanisms, and initiatives that are being designed or have been implemented to strengthen recycling systems in the Cook Islands.

The Cook Islands are made up of 15 islands and atolls that cover a total area of 237km<sup>2</sup>. A combined coastline of 120km is spread over 2 million km<sup>2</sup> in the Polynesian region of the mid-Pacific Ocean.

The islands consist of two main groups – the Northern Cook Islands and the Southern Cook Islands. Avarua is the country’s capital city, with the largest population, and is located on the island of Rarotonga.

## Socioeconomic background

The Cook Islands, a self-governing territory in free association with New Zealand, expects to become the Pacific’s first “green” destination. The *Cook Islands Renewable Energy Chart Implementation Plan 2012-2020 (GoCI, 2012)* commits the Government of the Cook Islands to increase the contribution of renewable energy to 100% of total demand across inhabited islands in the country by 2020.

A NZ\$260 million programme supported by the Asian Development Bank, New Zealand Ministry for Foreign Affairs and Trade and the European Union has realised the installation of solar photovoltaic power systems on the Northern Group Islands (2012) and in Rarotonga (2014). A further six solar plants are planned for up to six islands in the Southern Group Islands (*ADB, 2015*). The Pacific Islands Renewable Energy Investment Program will also be installing battery storage systems in the near future.

Increasing numbers of visitors are drawn to the Cook Islands each year to experience low-impact, eco-friendly tourism activities such as diving, kayaking, hiking, bird and whale watching. Tourism takes advantage of the 120km coastline of the Cook Islands. In 2016, tourists to the Cook Islands numbered 146,473 (*SPTO, 2017*), representing an increase of 17% on the previous year. The country’s 93 resorts and accommodation facilities predominantly are located on the seaside and beachfronts of the main islands, as follows:

- 13 on Aitutaki
- 2 on Atiu
- 77 in Rarotonga
- 2 on Mangaia

Improved waste management practices are considered to be a critical factor in retaining tourism as a key driver of economic growth. Tourism in 2012 accounted for approximately 54% of gross domestic product (*ADB, 2014*).

The country’s trade balance in 2015 was in deficit by A\$102 million, with exports at A\$23.7 million (+8.1% annualised) and imports at A\$126 million (+1.7% since 2010).

The primary export market destinations in 2015 were the People’s Republic of China, Germany, Japan, Poland and Thailand. The main import origins in the same year were Australia, the People’s Republic of China, Fiji, New Zealand and Turkey. (*OECD, 2017*).

In 2016, the estimated resident population - including short-term visitors - was 19,400. Approximately 2,900 (*GoCI, 2016*) live in rural areas, with the remainder living in the capital of Avarua on Rarotonga.

The approximate population distribution estimates for each of the 15 islands are as follows:

Northern Cook Islands	Population
Aitutaki	1,500
Mangaia	500
Atiu	450
Palmerston	60
Manuae	0
Rarotonga	10,500 (Capital)
Mitiaro	150
Mauke	300

Southern Cook Islands	Population
Manihiki	200
Nassau	70
Rakahanga	70
Penrhyn	200
Pukapuka	400
Suvarrow	0

Source: *Country Digest, 2017*



## Solid waste management

Recycling in the Cook Islands is relatively advanced, with polyethylene terephthalate (PET) bottles and aluminium cans being recovered from household and commercial collections and usually exported to New Zealand. Due to the low market price for glass, however, bottles are collected and crushed at the waste management facility for use as landfill cover or as an aggregate in concrete mixes. Similarly, cardboard, previously exported, is now mostly used as mulching material applied in the agricultural sector.

E-waste, whitegoods, steel cans, scrap steel and nonferrous metals, used lead acid and lithium batteries, and solar panels are stockpiled and exported for recycling and recovery purposes by a private operator. Used engine oil is reused in-country and exported, while end-of-life tyres are reported to be reused in-country only.

The material flow chart below is based on an analysis of Cook Islands imports of the 15 material categories studied, averaged over a seven-year period to 2016, compared with exports of those recovered recyclable materials, averaged over a two-year period 2015-2016, presented as a percentage of the total of the 15 categories. (Source: UN Comtrade, 2017)

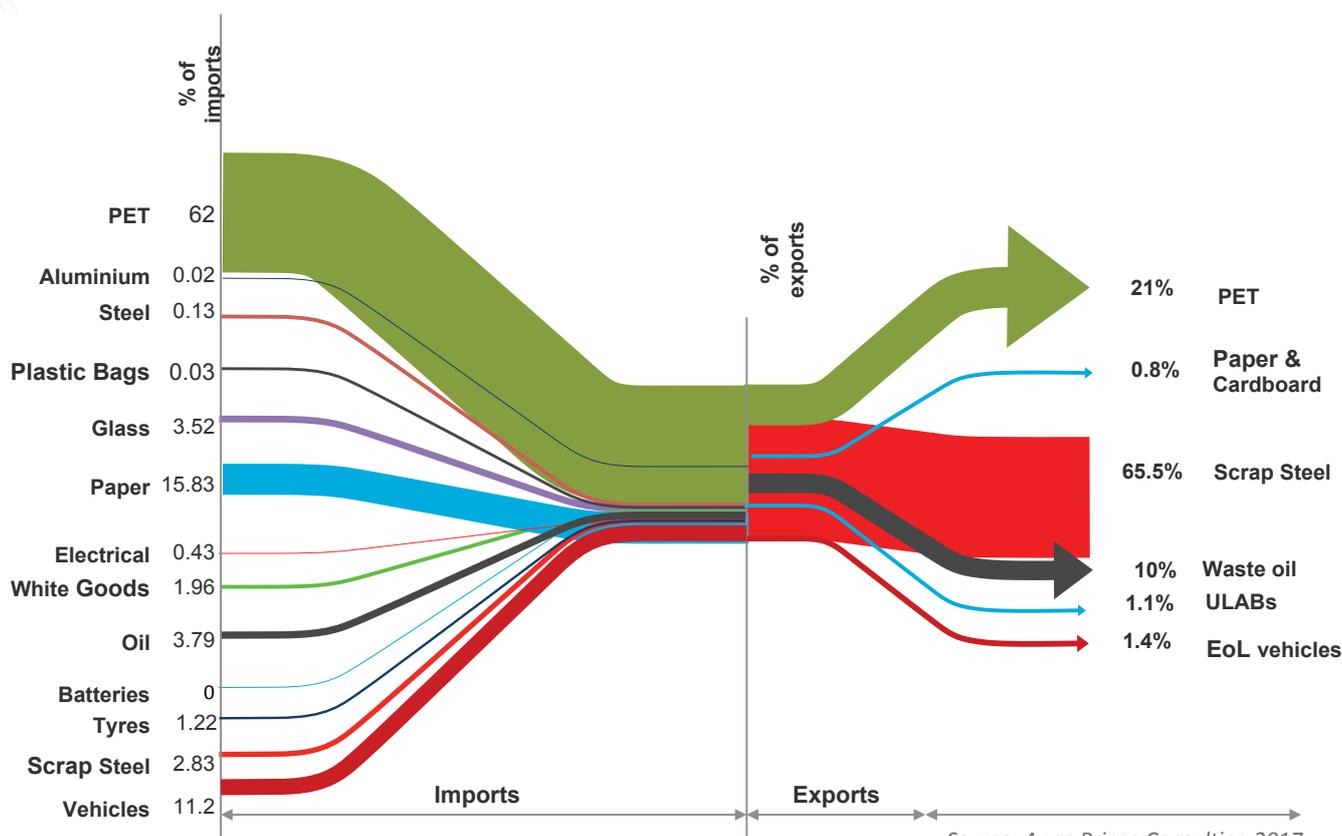
The analysis illustrates that imports of beverage containers of various material types, paper, cardboard and oils hold steady over the seven years. The number of motor vehicles of all types increased steadily during this period.

The Cook Islands exported more than 130 tonnes (t) of PET, 62t of cooking oil, 400t of scrap metal and approximately 9t of vehicles during 2015 and 2016.

This regional study coordinated by PRIF models the potential recovery of 15 materials types. A defined set of recovery rates was applied to the urban, rural, and outer island population distribution to calculate Cook Islands' potential recovery tonnage. The study compares various data to establish the context for the 15 waste materials.

Modelling of potential recovery of recyclable materials, presented in the table below, is based on an estimated average daily per capita municipal solid waste generation of 1.2kg (World Bank, 2012). It also applies a range of location-specific estimated recovery rates that are based on a set of assumptions of existing or introduced incentive-based policies and programs, such as container-deposit schemes and import levies. The resulting ratios were used to estimate average annual tonnages that could be recovered for recycling. (JICA, 2013; SPREP 2016; Mobile Muster, 2013; DOEE, 2017; Jambeck et al., 2015; MFAT, 2016; UNIDO/ICSHP, 2013).

## Material flow - Cook Islands



Source: Anne Prince Consulting 2017

\*The percentage of imports and exports displayed relate only to the proportion of the 15 materials categories studied, not total imports/exports



Cook Islands	
Recyclable Materials Forecast	Estimated Metric Tonnes
Polyethylene terephthalate (PET beverage containers)	60
Aluminium cans	118
Glass beverage containers	83
Steel cans	93
Plastic shopping bags	39
End-of-life (EOL) renewable energy equipment	-
Paper/cardboard	391
E-waste	2
Whitegoods	13
Used motor/cooking oil	118
Used lead acid batteries	21
Used lithium batteries	24
Scrap steel/nonferrous metals	140
EOL tyres	21
EOL vehicles	337
<b>Total</b>	<b>1,460</b>

Source: World Bank, 2012.

## Future waste management

Future increases in material recovery are expected from the PacWaste (2014-17) programme, which is in the process of being implemented by SPREP for the improved management of e-waste. Activities under this programme include the establishment of an e-waste pilot project for the safe dismantling of e-waste, a community awareness campaign and assistance in developing a national e-waste strategy (SPREP, 2017).

As the transition to renewable energy progresses, equipment such as solar panels and batteries will have a greater presence in the recoverable waste stream, as will household electrical items as a result of improved power access (ADB, 2017). Over 90% of the country's electricity demand is on the islands of Rarotonga and Aitutaki. Ten of the 12 inhabited islands will have almost 100% renewable energy by mid-2017.

The renewable energy project relating to the Northern Group Islands completed eight photovoltaic-diesel hybrid systems on six islands. Four further systems will be installed in the outer islands of the Southern Group by mid-2017 (GoNZ, 2016). The Renewable Energy Sector Project will install solar photovoltaic systems on five islands and three lithium battery storage systems. These projects are supported by the Asian Development Bank, European Union, Global Environment Facility, Green Climate Fund, New Zealand, United Arab Emirates, Japan, and the Government of the Cook Islands.

## Plastic marine debris

Mismanaged plastic waste eventually enters the marine environment by way of inland rivers and waste water outfalls or is transported by wind and tide. Rigid and light-weight plastic material from products consumed or used on a daily

basis become marine debris if not managed appropriately. An estimated 12% of the Cook Islands' waste stream consists of plastic components.

A recent study (Jenna *et al.*, 2015) indicates that coastal communities within a 50km range of the seaboard in the Cook Islands generate approximately 3t of plastic waste each day. An estimated 1.1t is mismanaged on a daily basis, entering the marine environment through release from uncontained disposal sites or by direct littering. As a result, an estimated 416t of plastic waste became marine debris in the waters around the Cook Islands in 2010 which, if not addressed, is expected to rise to 784t by 2025.

Of the 3t of plastic generated each day, approximately 0.3t may derive from PET or high-density polyethylene (HDPE) bottles, eligible for recycling under a container deposit scheme (CDS). Based on an average reduction rate of 40% in mismanaged waste with a CDS in place, approximately 0.05t of PET and HDPE plastic could be recycled each day. This could increase to an 80% or above reduction rate, depending on access to recycling collection services and viable markets, among others. Nonetheless, a 40% reduction in mismanaged PET and HDPE would result in approximately 397t of plastic becoming marine debris each year.

The outcome of mismanaged plastic can be divided into three groups: plastic that remains on the surface of the sea as floating debris, plastic that sinks to the ocean floor and plastic that washes up on the beach. A CDS that recovers 40% of HDPE and PET plastic bottles in the Cook Islands may achieve the following reductions in marine debris each year:

- 3t in floating plastic
- 13t in sunken plastic
- 3t in beach plastic

Further benefits attributed to a CDS are a potential reduction in annual damage costs for the 74 local fishing vessels of the Cook Islands (approximately US\$572). If beaches were cleaned up, it would save over US\$4,667, of particularly relevance to the amenities of coastal communities and the tourism sector.

## Infrastructure and services

Free weekly domestic waste and recycling collection services are provided to 100% (representing 74% of national population) of urban areas in Rarotonga.

Household waste and recycling collection services are delivered by a private operator under contract by the Ministry of Infrastructure Cook Islands. Household waste is placed in 60 litre bags and collected by a compactor vehicle. The weekly household recyclable service uses a trailer to collect PET, aluminium cans and glass bottles that are delivered to the Waste Management Facility for sorting and consolidation prior to export. Similarly, the private sector provides recycling services to commercial businesses, while hotels also transfer their own waste to the landfill.

The Rarotonga Waste Management Facility comprises the sanitary landfill (15-year capacity), constructed in 2006 with support from ADB, a transfer station and recycling centre. The Governments of Australia and New Zealand, with the private sector, have also supported improvements

at the site which employs eight operational staff. A building approximately 12 metres by six metres houses a baler to consolidate aluminium cans and PET bottles. Baled recyclables are loaded directly to 20' or 40' shipping containers for export and there are no further recycling storage facilities.

Glass bottles are also collected and are crushed for local use in concrete blocks, as road aggregate or as landfill cover. Cardboard is generally used for agricultural purposes and e-waste is collected and processed for export.

In addition to the facility in Rarotonga, the Cook Islands has 10 authorised open disposal sites and one other sanitary landfill - also constructed in 2006 with ADB assistance - with a life of 20 years. Recycle waste stations are also located on the outer islands. A small amount of recyclables is transferred to Rarotonga for export.

Community recycling and pickup stations provide services to householders in Rarotonga. Recycling waste stations with sorting areas are located on the outer islands; however these are generally uncovered facilities without storage. Rarotonga's Waste Management Facility currently receives a small amount of recyclables from the outer islands (ADB, 2014).

Cook Islands Recycling Creations retails giftware from reprocessed packaging materials, providing a forum to promote community awareness with regard to the benefits of recycling. Cook Islands Trading Cooperation Ltd., a private operation, manages a drop-off centre for dry recyclables, including paper, cardboard and fluorescent light tubes. These are then exported to New Zealand. Furthermore, Cook Island General Transport is a private land/sea transport business that collects periodically white goods, e-waste, used lead acid and lithium batteries, end-of-life solar panels, PET, aluminium cans and scrap metal, also for export to New Zealand. Both companies have balers on their premises. (Source: Cook Islands Pacific Regional Waste Strategy – Questionnaire, 2015).

## Logistics

The port of Avatiu at Avarua on the island of Rarotonga is the principal international port of the Cook Islands and is the transshipment port for cargo and passenger transfers to the outer islands. The port is operated by the Cook Island Ports Authority, as is the second port, Arutanga, located on the island of Aitutaki, 162km from Rarotonga.

The port terminal is approximately one hectare in size, and facilities include a main quay (260 metres long by around 8 metres deep) and a warehouse. There is neither a shore crane nor are there private stevedore services available.

The Port of Avatiu is serviced by the Polynesia Line that provides container shipments to New Zealand on a 21-day schedule. The estimated twenty-foot equivalent unit (TEU) shipping container rates, presented in the table below, are based on the cargo of nonhazardous goods, inclusive of un/loading and bunker adjustment factor (BAF). They do not account, however, for customs clearance, duties and quarantine inspection.

Cook Islands: Shipping Line		
Polynesia Line		
Destination	Schedule	Est. USD per TEU
New Zealand	21-day	3,150

AMSTEC Pty Ltd

Notes: USD = U.S. dollar; TEU = twenty-foot equivalent unit.

The Port of Avatiu is capable of handling 4,000 TEU per year. The port has a throughput of approximately 2,200 import, 300 export and the return of 1,900 empty containers each year which may potentially be made available for reverse logistic arrangements.

## Cook Islands

The outer island harbours, in general, are able to cater for the inter-island freighters and passenger services that are privately operated. Taio Shipping Ltd. runs its ships to the islands of Penrhyn, Rakahanga and Manihiki in the Southern Group Islands every two months, as well as to the islands of Atiu, Mitiaro, Mauke and Mangaia in the Northern Group Islands every two and a half months. Barge services are also supplied by Cook Islands Towage Ltd.

## Institutional framework

Data relating to the institutional framework of the Cook Islands have been gathered from the database of the Pacific Islands Legal Information Institute (PacILII, 2017). ECOLEX is also an information service that relates to environmental law (ECOLEX, 2017), from which various data also have also collected.

Governance responsibilities for solid waste management are spread over a number of agencies. Environment Act 2003, administered by the Ministry of Environment Services, establishes the National Environment Service and the Island Environment Authority. The former entity is responsible for environmental policy development, education and awareness. It also enforces regulations on illegal dumping, controls and monitors pollution, sets environmental standards at the Rarotonga Waste Management Facility and ensures the environmentally safe disposal of chemicals.

Regulations passed in 2008 control waste management practices on the outer islands of Atiu, Takutea and Mitiaro. Since 2012, while further regulation prohibits the importation of plastic and nonbiodegradable bags, it monitors the import of biodegradable bags.

Environment Act, Section 37, authorises the National Environment Service to prepare management plans for the islands. This comes at the request of the Island Environment Authority.

Public Health Act 2004 and Ministry of Health Act 2013 are administered by the Ministry of Health. The Ministry is responsible for policy development and the implementation of laws and programmes for public health and environmental protection, providing for the safe storage, collection, treatment, transport and disposal of solid and hazardous waste materials.



Prevention of Marine Pollution Act 1998, administered by the Ministry of Transport, prevents pollution and the dumping and transport of other waste in Cook Island waters by vessels. It gives effect to international conventions on marine pollution and protection.

As a result of the Cook Islands National Solid Waste Management Strategy 2013-2016, a waste management policy and legislative framework were introduced. The strategy recognises the need for a single solid waste management (SWM) entity, a dedicated fund solely for the management of solid waste, a national waste audit and an economic assessment of the costs associated with SWM. A “Zero Waste Cook Islands” goal, based on the 4R approach (Refuse, Reduce, Reuse and Recycle), is embedded in strategic policy. The polluter pays principle, as well as other precautionary, consultation, waste hierarchy and proximity principles, underpin the strategy and its objectives to improve the following:

- waste minimisation
- institutional framework
- the waste management infrastructure, including storage facilities for hazardous waste, recycling and solid waste
- financial mechanisms for cost recovery of collection and disposal fees, as well as an advance disposal fee levied on the import of selected goods and potential CDSs
- environmental education and awareness
- reliability of data collection, monitoring and analysis.

The initiatives of the strategy were expanded in the National Solid Waste Management Policy 2016-2026, linking them to those in the National Sustainable Development Plan 2016-2020 by way of Goal 3, “Promote sustainable practices and effectively manage solid and hazardous waste”. The policy defines a number of options for financing recycling activities, such as:

- introduction of a container deposit scheme on aluminium and PET containers
- an advance disposal fee levied on selected imported items
- creation of a dedicated trust fund to cover the costs of SWM processing and exporting.
- A subsequent proposal intends to impose an advance disposal fee on vehicle imports to curb the issue of abandoned old cars on the island of Rarotonga by introducing a car bailer for scrap metal recycling.

The role of the Water, Waste and Sanitation Division of Infrastructure Cook Islands (ICI) is to oversee the waste management facility operations and waste collection services on Rarotonga. The agency advises the island governments responsible for waste management on outer islands.

Island Government Act 2012-13, administered by the Office of the Prime Minister, establishes the island governments (councils) and the Island Governments Association. Island governments are able to enact laws that conserve and sustain the relevant island environment, consistent with the provisions incorporated into Environment Act 2003. Other legislation includes the Reuse of Bottles Act 1988 that defines the ownership of bottles and provides for their reuse.

The Cook Islands is a party to various multilateral environmental agreements and conventions, listed in the following table.

Cook Islands	
Multilateral Environmental Agreements and Conventions	Status
Stockholm Convention on Persistent Organic Pollutants	Ratified
Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal	Ratified
1995 Waigani Convention	Ratified
Rotterdam Convention	Ratified
Montreal Protocol on Substances that Deplete the Ozone Layer	Ratified
MARPOL 73/78: International Convention for the Prevention of Pollution from Ships, 1973 as modified by the Protocol of 1978 (Annex I, II, and IV)	Ratified
International Convention on Civil Liability for Oil Pollution Damage, 1969 ( renewed 1992)	Ratified
International Convention on the Protocol of 1992 to Amend the International Convention on the Establishment of an International Fund for Compensation for Oil Pollution Damage, 1971	Ratified
Bunkers Convention 2001	Ratified
International Convention on the Control of Harmful Anti-fouling Systems in Ships (AFS Convention)	Ratified
Ballast Water Management Convention 2004	Ratified
Nairobi International Convention on the Removal of Wrecks 2007	Ratified
Noumea Convention	Ratified
Protocol on Dumping	Ratified

Source: SPREP. 2016.



PHOTO: ADB

## Financial mechanisms

*Currency: Cook Island dollar (\$) and New Zealand dollar (NZ\$).*

Households are provided with waste collection services free of charge. ICI is allocated an annual budget of NZ\$422,000 for the management of solid waste services on Rarotonga, which includes the operations of the waste management facility. The additional budget is drawn from landfill disposal fees of approximately NZ\$67/t, paid by commercial and self-haul entry fees. Previously a NZ\$5 departure tax was transferred to a special purpose environmental protection fund, with NZ\$3.50 allocated to SWM. The fund has been abolished and departure tax revenues are considered consolidated revenue.

The Minister for ICI established a Waste Financing Committee in 2012 to investigate options for the long-term financing of SWM. The National Solid Waste Management Strategy identifies the potential for a container deposit scheme for aluminium and PET beverage containers, an advance disposal fee levied on selected imported items, and the creation of a dedicated trust fund to cover the costs of exporting and processing solid waste.

Island governments receive an annual stipend from the National Government. They also may levy property rates, fees and tariffs, as well as impose fines and penalties.

## Conclusions

Recycling and on-island re-use systems are relatively advanced in the Cook Islands and public policy is designed to achieve sustainable waste and environmental management outcomes. National Solid Waste Management Policy 2016-2026 identifies CDS, advance disposal fees levied on specific imported items and the creation of an administrative fund for waste processing and export as key mechanisms to support sustainability.

A recent initiative discounts the cost of incinerating solid waste in the Cook Islands. (Tonkin and Taylor 2015). Furthermore, the need for increased management controls for plastic waste has been clearly identified. (Cook Islands National Solid Waste Management Strategy 2013-2016).

The Port of Avatiu does not have the capacity to handle increased cargo volume. Direct shipping services are limited.

## Abbreviations

ADB	Asian Development Bank
AFS	Anti-fouling systems
BAF	Bunker adjustment factor
CDS	Container deposit scheme
DOEE	Department of Environment and Energy (Australia)
EOL	End of life
FY	Financial year
GoCI	Government of Cook Islands
HDPE	High-density polyethylene
ICI	Infrastructure Cook Islands
ICSHP	International Centre on Small Hydro Power
JICA	Japanese International Cooperation Agency
kg	kilogram
km	kilometre

km <sup>2</sup>	square kilometre
MARPOL	International Convention for the Prevention of Pollution from Ships
MFAT	Ministry of Foreign Affairs and Trade (New Zealand)
PET	Polyethylene terephthalate
PRIF	Pacific Region Infrastructure Facility
SPREP	Secretariat of the Pacific Regional Environment Programme
SPTO	South Pacific Tourism Organisation
SWM	Solid waste management
t	tonne
TEU	Twenty-foot equivalent unit
UNIDO	United Nations Industrial Development Organisation
USD	United States dollar

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