

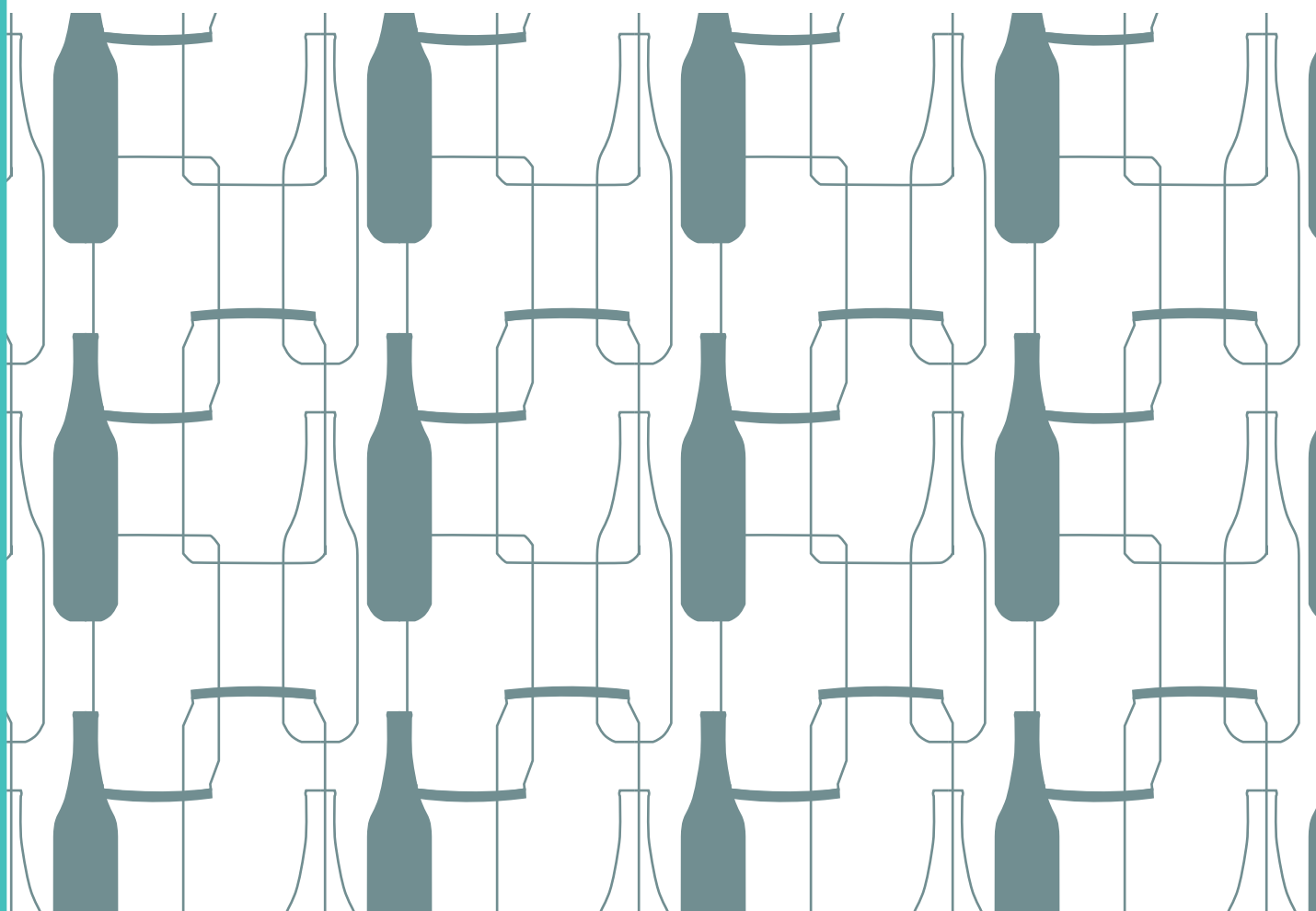
Container Deposit Schemes

in the Pacific Islands



March 2022

A Guide for Policy Makers



Container Deposit Schemes in the Pacific Islands – A Guide for Policy Makers –

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Table of Contents

Acronyms	4
Key Terms	5
Foreword	6
Acknowledgements	7
Introduction: Container Deposit Schemes for Waste Management in the Pacific	8
How to Use the Guide: Overall Guide for Introducing Container Deposit Scheme	12
Chapter 1: Building Technical Knowledge	15
Unit 1: Key Stakeholders	16
Unit 2: Operational Models	18
Unit 3: Legal Arrangements	20
Chapter 2: Designing a Viable CDS/ Conducting a Feasibility Study	25
Element 1: Deciding the Target Products and Estimating Waste Generation	28
Element 2: End of Use Product Management and Material Recovery Facilities	32
Element 3: Mapping the Collection/ Redemption Points	35
Element 4: Assessing Who Can Operate the System (System Operator)	38
Element 5: Estimating the Running Cost (Handling Fee)	41
Element 6: Determining Refunds and Deposits	43
Element 7: Establishing the Fund Management System	46
Element 8: Absorbing Legacy Waste	49
Element 9: Data Reporting and Implementation Monitoring	50
Chapter 3: Lessons Learnt	52
Case 1: The Marshall Islands - Project for Introducing and Operating a Container Deposit Scheme	53
Case 2: Republic of Kiribati	65
Case 3: Kosrae State, Federated States of Micronesia	72
Case 4: Yap State, Federated States of Micronesia	79
Case 5: Republic of Palau	87
Case 6: Tuvalu	97
Works Cited	106

List of Tables

<i>Table 1 Container Deposit Scheme in PICs</i>	9
<i>Table 2 Example of Features</i>	11
<i>Table 3 Business stakeholders for running CDS</i>	17
<i>Table 4 CDS Operational Models</i>	18
<i>Table 5 MRFs for CDS in PICs</i>	34
<i>Table 6 System Operators in PICs (as of 2021)</i>	38
<i>Table 7 RMI Redemption Result 2019</i>	55
<i>Table 8 Income and Expenditure of CDS System Operator (MAWC) 2019</i>	55
<i>Table 9 Agencies Involved for RMI CDS</i>	56
<i>Table 10 Deposits, Refunds, Handling Fee (RMI)</i>	57
<i>Table 11 Kiribati Redemption Result 2020</i>	65
<i>Table 12 Agencies Involved for Yap State CDS</i>	67
<i>Table 13 Kosrae State Redemption Result 2017</i>	72
<i>Table 14 Agencies Involved for Kosrae State CDS</i>	74
<i>Table 15 Deposits, Refunds, Handling Fee (Kiribati)</i>	75
<i>Table 16 Yap State Redemption Result 2021</i>	79
<i>Table 17 Yap State Redemption Rates (all items)</i>	80
<i>Table 18 Agencies Involved for Yap State CDS</i>	82
<i>Table 19 Deposits, Refunds, Handling Fee (Yap State)</i>	82
<i>Table 20 Palau Redemption Result 2020</i>	87
<i>Table 21 Agencies Involved for Palau CDS</i>	89
<i>Table 22 Deposits, Refunds, Handling Fee (Palau)</i>	90
<i>Table 23 Operation of the Redemption Centers</i>	92
<i>Table 24 Expenditures by the Recycling Fund (FY 2011-2020)</i>	92
<i>Table 25 The End of Use Product Management through Palau CDS</i>	94
<i>Table 26 Redemption Rate at each Redemption Center in Palau</i>	95
<i>Table 27 Redemption Rate of Palau CDS (FY2011 to FY2020)</i>	95
<i>Table 28 Reporting Requirements for Palau CDS</i>	96
<i>Table 29 Tuvalu Redemption Rate 2020</i>	98
<i>Table 30 Tuvalu Redemption Rate 2021</i>	98
<i>Table 31 Agencies Involved for Tuvalu CDS</i>	100
<i>Table 32 Deposits, Refunds, Handling Fee (Tuvalu)</i>	100

Acronyms

CDS	Container Deposit Scheme
FSM	Federated States of Micronesia (Micronesia)
JICA	Japan International Cooperation Agency
J-PRISM	Japanese Technical Cooperation Project for Promotion of Regional Initiative on Solid Waste Management in Pacific Island Countries
MRF	Material Recovery Facility
PET	Polyethylene Terephthalate
PICs	Pacific Island Countries
RMI	Republic of the Marshall Islands (Marshall Islands)
SPREP	Secretariat of the Pacific Regional Environmental Programme
UNDP	United Nations Development Programme

Key Terms

Deposits	The money paid at first sale or import of a beverage
Refunds	The money paid out to the public for each beverage container returned
Handling fee	Remember the simple formula: 'Handling Fee = Deposit rate – Refund rate' Fee to cover the cost of handling and processing the collected materials.
Special fund	The technical term for a government operated fund account that is separate from normal general revenue and government operations accounts. A Special Fund is set up for a specific purpose under government financial management legislation.
Legacy waste	'Legacy waste' is waste from drinks that have already been consumed before the start of the CDS, and that might be collected when the system starts but have not paid a deposit. It can often be seen lying around as litter, or stockpiled. Seed money is required to cover the redemption and processing of legacy waste as there have been no deposits paid so as to pay out refunds on that waste.
Seed money	'Seed money' is money required at the time system starts to capitalize the fund to deal with legacy waste.
Redemption rate/ Recovery rate	This is the percentage of all beverage containers returned for refund compared to the total number paying deposits
Recycling rate	This is the percentage of all beverage containers recycled compared to the total number paying deposits

Foreword

Recycling of waste materials in the Pacific Islands is an economic challenge. The islands are remote; populations, and quantities of materials generated as waste are comparatively small; shipping costs are high, and the recyclable materials will have to be exported for industrial processing.

A Deposit and Refund Scheme is an economic instrument that encourages the public to participate in materials recovery. Container Deposit Schemes (CDS) specifically target beverage (drink) containers, and a significant part of the recyclable waste stream of a Pacific Island is usually drink cans and bottles. Deposits are paid on the target products before sale to the public, and refunds are paid out when the empty containers are collected and brought in by consumers. Such a scheme builds a financial base for recycling and/or proper disposal of these items, and are part of a class of economic instruments called 'Product Stewardship Schemes' (PSS) which can be used to target a wide variety of materials for recycling. In Pacific Island Countries (PIC), such schemes have been operated in four countries since the first was introduced in Yap State, one of the Federated States of Micronesia, in the 1990's.

In response to the request from PICs to promote materials recovery through a CDS, a three-year JICA project (2005-2008) assisted Palau in building the capacity of the personnel assigned to regulate the CDS. After the CDS regulation went into effect in 2009, the monitoring capacity was strengthened through J-PRISM Phase I (2011-2016). J-PRISM II (2017-2022) has also been supporting Pohnpei State of the Federated States of Micronesia to help improve their existing system, and also Chuuk State with ongoing legislation development. In addition, J-PRISM II has provided Technical Assistance to the Republic of the Marshall Islands with its achievement to commence operations of a CDS in 2018 on Majuro atoll, and expanded to the country's second urban area, Ebeye, in 2021. In Vanuatu during J-PRISM Phase II, introduction of CDS was approved by the Council of Ministries in 2019 and in consequence detail planning has been in progress towards commencement of a Product Stewardship Scheme in Vanuatu for selected beverage containers.

This document summarizes the points necessary for the design of a CDS, draws from case studies in the Pacific, and the lessons learned from J-PRISM's technical cooperation to PICs. It aims to be a guide for the Pacific Island Countries and other Small Island Developing States to introduce CDS in a way suitable for their own socioeconomic conditions and waste management policy. Whilst the Guide does its best to cover the key points, inevitably each country will have its own unique elements, and thus the Guide cannot cover all contingencies.

Because of the socioeconomic impact and complexity of the CDS, the development process generally requires feasibility studies that make estimates of the amounts of empty beverage containers that can be collected, and such things as an appropriate deposit/refund rate. Such studies may need outside consultancy support. However, government agencies that are taking decisions on CDS will need to take the lead with facilitating cooperation with businesses, citizens, and related organizations while making the best use of such outside expertise. Therefore, we believe that it is important for policy makers to have a clear vision of how a CDS might work, to assist them on their policy-making pathway towards successful introduction of a CDS by understanding various operational models, legislation, and key elements of these systems; and this is what this Guide hopes to offer.

We hope that this Guide will promote knowledge sharing among countries, and will help policy makers and practitioners further strengthen their capacity necessary for introducing the Circular Economy into the region.

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Introduction

Container Deposit Schemes (CDS) for Waste Management in the Pacific

1. Approach and Purpose of Container Deposit Schemes (CDS)

A Container Deposit Scheme (CDS) is a policy instrument that financially motivates people to collect and bring used beverage containers to a designated Collection Point, so that the beverage container materials can be treated for proper disposal or effective use of resources. Deposits are levied at the time of import or local selling of the target products, and the deposit - or part of - is refunded to people when they bring those items in for recovery. Beverage containers, non-durable goods, are the most common target products for Deposit Schemes worldwide, but other recyclables and problematic waste such as used home appliances or lead-acid batteries can also be dealt with by such schemes.

The CDS is generally expected to have the following outcomes:

- Promotion of recycling and a circular economy for waste materials;
- Promotion of proper disposal;
- Securing financial resources to promote recycling and proper disposals;
- Reduction in litter from beverage containers consumed away from the home.

CDS creates a formal system for aggregating the end of use beverage containers, and it is important to coordinate with existing collection systems if present. For example, in places where a local beer manufacture collects their own used bottles for refilling, it is important that the legislated CDS will not hinder such efforts.

2. Outlook of CDS in the Pacific

As of the time of writing, there are a number of Pacific Islands Countries where a CDS is in place for the purpose of recycling or proper disposal. Tuvalu commenced their own deposit scheme in 2019 starting with aluminium cans, PET bottles, and lead acid batteries for recovery. Chuuk State and Pohnpei State, of the Federated States of Micronesia are currently reviewing their existing legislation to improve implementation. In Vanuatu, the Council of Ministers approved the proposed CDS concept in 2019 and as a result a Working Group was established in 2020 for discussing the details of system design with concerned parties involving local manufactures, importers, retailers and, recyclers.

Table 1 Container Deposit Schemes in PICs

Countries/ States		Population	Implementation
Kiribati		117,608	Started in 2004-2005 .
FSM	Kosrae State	6,600	Started in the 2007 .
	Yap State	11,400	Started in the late 1995 , and restarted in 2007 after cyclone Sudal.
	Pohnpei State	36,200 (National census 2010)	Operational since 2010s. Revision of the legislation/ system is underway.
	Chuuk State	48,600 (National census 2010)	Legislations had been in place since 1990, System collapsed in early 2000s. Revision of the legislation and system is underway.
Palau		18,001	The programme was approved in 2006 : Operation started in 2011 .
RMI		58,791	Started in 2018 in Majuro Atoll, and in July 2021 in Kwajalein Atoll.
Tuvalu		11,655	Started in 2019 with redemption of 3 categories and with 3 categories in 2020 out of 14 categories of goods included in the regulation.

3. Scheme Overviews



Republic of Kiribati [Population: 117,608 (WB, 2019)]

The Kiribati recycling system - called the 'Kaoki Maange' which means 'Return the Rubbish' - was developed from 2002 to 2005 by the local NGO 'Foundation for the Peoples of the South Pacific Kiribati' (FSPK) working alongside the Kiribati government. FSPK raised funding for an initial system design report, which then led into the development of a recycling yard provided by the government, and some equipment provided by a variety of donors and small grants. In 2004, the UNDP partnered with the project, and funded it through to completion in 2005, when it was fully operational and tendered out to a local business. The initial system operator, who had contracted operations all through project development, failed after a few months, and a second operator then took over, who has remained until the time of writing (2021). In the early years very high recovery rates of well over 90% were recorded but this looks to be slightly lower today. The system handles aluminum cans, PET bottles, and lead-acid batteries. For more details, please read [the case study](#) in Chapter 3.



Kosrae State, Federated States of Micronesia [Population: 6,600 (National Census, 2010)]

Kosrae had an aluminum can deposit & refund system from 1991, run by the Kosrae Community Action Program, a government supported NGO. But the system collapsed later in the 1990s. In 2006, UNDP funded a feasibility study to look at re-starting and expanding the system, following the success of UNDP support for Kiribati. In 2007, the new system started after the old legislation was repealed and a new version put in place that handled aluminum cans, PET bottles, glass bottles, and lead-acid batteries. The new system was tendered out to a local business, who also operated a hotel and tourism operation. The State plays a role in collecting the deposits, paying out refund claims, and providing a space for the Materials Recovery Facility (MRF). The recovery rate when the system started was over 90%. A study in 2017 conducted by J-PRISM II showed the rate had dropped to around 86%, with a

higher rate for aluminum cans but PET lower at around 63%, with around 1.2 million aluminum cans & glass bottles and over 700 lead-acid batteries per year. With the start of the pandemic the system stopped but restarted in the mid. 2021. For more details, please read [the case study](#) in Chapter 3.



Yap State, Federated States of Micronesia [Population: 11,400 (National Census, 2010)]

Yap had a legislated aluminum drink can deposit refund system operating from late 1995, but it stopped working after the massive Cyclone Sudal damaged Yap State in 2004. In 2006, the UNDP conducted a feasibility study on introducing Container Deposits Schemes into each of the four states of the FSM, and in 2007 UNDP supported Technical Assistance to Yap State to help re-start the system. This required repeal of the existing law, and the passing of a new Act, which then included the power to regulate. The system then included aluminum cans, PET bottles including PET cooking oil bottles, and glass bottles. A local company invested in a large scrap metal baling press, and this was installed in a government-owned disused fish processing building at the wharf, which became the MRF. A single system operator was engaged in 2007 at the start of the current system. Total recovery rate in 2018 hit 86% with 99% of aluminum cans, 45% of PET bottles, and 20% of glass bottles. For more details, please read [the case study](#) in Chapter 3.



Republic of Palau [Population: 18,001 (WB, 2019)]

A Container Deposit Scheme recycling program was first approved in 2006 through the national congress. However, implementation was put on hold until 2011. In the meantime, several measures were taken, including training of personnel from the responsible government agencies, assisted through a JICA technical cooperation project, and the construction of a recycling facility by Koror State Government, which later became the initial Redemption Center used for the national recycling program. The regulations were put in place in 2009 and redemption started late 2011 after six-month period of deposit collection. The redemption rate was highest in the first three years at over 90%, and decreased to 77% in the fourth year. It recovered in the sixth year (FY2017) to over 80%, which may be attributed to the opening of another redemption center in 2016. The Redemption rate has settled at 80-90% from 2017. Redeemed items include a variety of materials such as aluminum, steel, plastics, glass, and tetra pack. The program is unique in terms that a quarter of deposits are not paid out to the public but retained in the Recycling Fund and used for waste management in Palau, such as landfill improvement. For more details, please read [the case study](#) in Chapter 3.



Republic of the Marshall Islands [Population: 58,791 (WB, 2019)]

The system covers PET and glass drink bottles, and aluminum cans. With technical assistance from J-PRISM II, the RMI passed an amended law and regulations in 2018, after an initial attempt in 2016, and this allowed the recycling system to start in August that year. The system has made a very significant impact on cans & bottle litter on Majuro Atoll, the capital, the island where half the county's population lives and where most of the consumption of packaged beverages takes place. A number of people have become avid collectors to generate an income, and the recovery

rate has been high, at around 85-90% overall. Only one Collection Point exists on Majuro, at the dumpsite recycling centre, whilst another opened in Ebeye (Kwajalein Atoll) in July 2021. For more details, please read [the case study](#) in Chapter 3.



Tuvalu [Population: 11,655 (WB, 2019)]

The Tuvalu Waste Management Levy Deposit Regulation (WMLDR) was established in August 2019. The regulation covers 14 categories of waste items including beverage containers. The introduction of the regulation is part of the conditions of an agreement under the EU-Tuvalu Waste Management Project 2016 -2021, with expectation of sustainable funds to support waste management in the country after the project ends. Redemption started in February 2020 with PET bottles, aluminum cans, and lead-acid batteries after 6-month period of deposit collection. Several items stipulated in the regulation such as lubricating oil or nappies are subject to levy but not subject to refunds under the regulation. The regulation is a combination of a Deposit Scheme which uses economic incentives, and a taxation measure which uses an economic disincentive to the purchase of certain products. For more details, please read [the case study](#) in Chapter 3.

4. Features and Differences of CDS in the Pacific Islands Countries

Each CDS in the Pacific has its own characteristics in system design. For example, target products, along with their end of use management may be different and relies on the capacity of any national waste management and recycling, and accessibility to overseas recycling markets. Some other differences such as institutional arrangements for material handling process, collection point mapping, or material recovery facilities are detailed throughout this guide.

Table 2 Example of Features

Countries/ States		Redemption Rate *1	Target Items
Kiribati		N/A	Aluminum cans, PET bottles, PET preforms, Lead-acid batteries
FSM	Kosrae State	86.1	Aluminum cans, PET bottles, Glass bottles, Lead-acid batteries
	Yap State	113.9	Aluminum cans, PET bottles, Glass bottles
	Pohnpei State	57.2	Aluminum cans
Palau		90.3	Aluminum cans, Steel cans, Plastics, PET preforms, Glass bottles, Tetra pack
RMI		109.5	Aluminum cans, PET bottles, Glass bottles
Tuvalu		66.93	Aluminum cans, PET bottles, Lead-acid batteries, Nappies (no refund), Vehicles, Motorbike
(*1) This is the percentage of all beverage containers returned for refund compared to the total number paying deposits. Redemption Rate by material type is available in some PICs where the deposits are collected and recorded by material type at the time of import or local production.			

(References for above information are noted in [Chapter 3; Lessons Learnt from each country](#))

How to Use the Guide

Overall Guide for Introducing A Container Deposit Scheme (CDS)

1. Purpose, Scope, and Target of the Guide

This guide was developed to summarize the points necessary for system design regarding Container Deposit Schemes (CDS) based on actual cases in Pacific Islands Countries, with the aim to assist other Pacific Island Countries, or any other SIDs, who may wish to consider designing and implementing their own system.

Note that although this guide mainly deals with deposit schemes for beverage containers, the policy cases introduced in this guide may include recyclables and waste materials other than beverage containers.

CDS can be implemented either voluntarily by the private sector on a commercial basis, where bottles are refilled, or as a policy by the government where national legislation is used for improved waste management and environmental protection. This guide covers nationally, legislated systems and targets government officials and others who may seek to determine the applicability of CDS to their nation, and if it will fit in with local economic and social conditions. The guide may also be useful to other government agencies; private companies involved in manufacturing, importing and selling beverages; civil society organizations; or educational and research institutes.

2. Steps to Introduce CDS

If the Reader is interested in developing a CDS for their country, it is recommended in the first instance to read through the Guide from the beginning to the end to get a good understanding of the contents, and overall design. Later, the Guide may be useful as reference tool concerning specific aspects of CDS design and implementation.

[The first chapter](#) covers three themes that are essential to consider before getting into the detail design of the scheme: the key parties, or stakeholders, to work with; different operational models; and possible legal arrangements.

Unit 1 Key Stakeholders

There are three main Stakeholder groups, Government, local commerce as represented by importers and local producers of drinks, along with private recyclers and waste collection operators, and the public. As it is the commercial sector who will pay the deposits at the start, it is very important that they are consulted early on in any system development. Any proposed system must have a clear understanding about the local business structure, public engagement that may be required, and government agencies and who bears the various responsibilities.

Unit 2 Operational Model

The management system suitable for the funds and the target materials varies place by place worldwide. However, there are two main operational model types; the Special Fund Model and the Managing Agency Model, depending on the presence of industry and population size, which can be referred to as a starting point to determine how any CDS might work in a particular country.

Unit 3 Legal Arrangement

Getting a clear idea of the legislative pathway is essential early on, even if the details are worked out later once the system design is clearer.

The following chapters guide the reader through key elements for designing details of the system, while offering practical methods to examine the feasibility of any proposals.

Element 1. Deciding the Target Products and Estimating Waste Generation

- Target products can be decided through a situation analysis, including analysis of waste audit data and review of any existing waste recovery, waste management, and recycling activities.
- Estimate the target product amounts by analysis of both local production quantities from businesses and import data from Customs.

Element 2. End of Use Product Management and Material Recovery Facilities

- Plan out for, and investment required, as to how the collected materials will be treated. They may be processed for recycling, reused locally, or otherwise disposed of.

Element 3. Mapping the Collection/ Redemption Points

- Determine where the Collection Points might be sited so the public can bring items in for refunds.

Element 4. Assessing Who Can Operate the System (System Operator)

- Understand what capacity is needed for those who operate the physical collection and refund payment system, including collection, processing, recycling, export, and finance.

Element 5. Estimating the Running Costs (Handling Fee)

- Identify how and at what cost the materials will be processed for recycling as well as repurposing and/or disposal.

Element 6. Determining Refunds and Deposits

- Determine the deposit and refund values through understanding the impact to both the public and business of different levels of deposit and refund, so that the impact is as small as possible whilst maintaining the incentive for consumers to bring in the target items.

Element 7. Establishing the Fund Management System

- Set up provisions that protect the Recycling Fund, such as keeping it apart from any government revenue accounts, and the reporting system for claiming refunds.

Element 8. Absorbing Legacy Wastes

- Estimate potential items that may be returned for refund but on which a deposit has NOT been paid as they were already in the country before system start up, for example existing litter.

Element 9. Data Reporting and Implementation Monitoring

- Develop the systems whereby data is recorded and reported to the Fund manager and the regulating agency, so as to evaluate effectiveness and avoid problems developing, such as cash-flow issues.

[Chapter 3](#) details the legislative framework and system design of those CDS already in place in Pacific Island Countries. Lessons learnt and experience gained from implementation are very valuable.

The Marshall Islands	<ul style="list-style-type: none"> ➤ Legacy waste estimation and financing ➤ Development of legal framework ➤ Public awareness
Republic of Kiribati	<ul style="list-style-type: none"> ➤ Satellite collection points ➤ Collection of legacy waste ➤ Naming the system
Kosrae State, Micronesia	<ul style="list-style-type: none"> ➤ Adjustment to deposit rate ➤ Mobile collection points ➤ Alternate use for PET and glass
Yap State, Micronesia	<ul style="list-style-type: none"> ➤ Support from the private sector ➤ Legacy waste financing ➤ Counting cans and bottles
Republic of Palau	<ul style="list-style-type: none"> ➤ Two redemption center operators ➤ Local capacity development for monitoring ➤ Operation manual

Conversions

Pounds and gallons shown below are all United States measures which can be seen in the case studies in the Micronesian countries. Here is some guidance for converting these measures.

Weight	<p>One pound (lb) is 453g, or 0.453kg</p> <p>One ounce (oz) is 28.35 g</p>
Volume	<p>One gallon is 3.785 liters</p> <p>One fluid ounce (fl.oz) is 0.029 litre</p> <p>33.8 fluid ounces is 1 litre</p>

Chapter 1

Building Technical Knowledge

UNIT 1:

Key Stakeholders

1.1 Government/ Ministries

The Government of a country is the most important driver of any Container Deposit Scheme as a law must be put in place to ensure that deposits are paid on all items covered by the system. If there is no law, then there is no means to enforce payment by importers or local producers. So it is essential that if a CDS is to be set up, then the Government must agree to the initial investigations, such as a feasibility study, being conducted. So it is important to determine at the outset which Ministry or Department of the Government is the lead agency for setting up a CDS.

Legislative work is important for the government; one of the first things to find out is if an existing Act can be used to collect the deposits, or does a whole new Act need to be drafted and passed by Parliament. Then there is the matter of creating Regulations, and what those Regulations might say. It needs to be clear who would be the government entity that is the Regulator. It may be that the lead agency who drives the feasibility study is also the part of the Government that becomes the regulator of the system, but this is not always the case, it depends on how the legislation is structured.

Whilst the Ministry of Finance might be the recycling fund manager, it may well be that another Ministry or Department is responsible to be the regulator, and oversee the recycling system. These are very important points that any study must address, so that the government and the Legislature can clearly see what is being proposed for the CDS in order to determine whether to pass any additional laws.

1.2 Local Industry and Commercial Sector

The structure of the local beverage commercial sector is very important to understand and consult. Who are the importers and who are retailers of the target products? Are there any local business associations that might need to be consulted? The structure of the local market for the target goods must be understood, as it is important that, as far as possible, the CDS should not disrupt commercial activity and impact sales. Because the deposit applies across the board to all businesses who make or import drinks in the country, the impact on those businesses should be equal.

If the local drinks market is disrupted, then the system may well be unpopular with both commerce and consumers, and so be difficult to introduce. It is essential to remember that the primary function of any deposit is to create an incentive big enough to return a significant proportion of the target products, but small enough that does not impact normal trade. Ideally, the deposit will be 'invisible' to consumers. This can be determined partly through surveying the prices of target products in local markets and seeing how much the proposed deposit would be compared to the overall price of the product, as well as the typical variation in price across different stores. See [Element 6, Chapter 2](#) for more details about deposit setting.

Table 3 Business stakeholders for running CDS

Business	Concept
Producer	Importers and manufacturers of beverages
Importer	Importers of beverages
Manufacturers	Local bottlers of beverages
Wholesaler	A business that sells products in bulk, such as cartons/cases. May also be an importer.
Retailer	A business that sells the beverages to the public
System Operator	The business that collects the empty beverage containers for recycling, pays out the refunds to the public, and has a contract to operate the collection side of the CDS
Waste Operator	Responsible for the of end of use product management (including recyclers, waste collectors, processors). System Operator may well also be a Waste Operator.

1.3 Consumers/ Public

The consumers are the ones who buy the drinks and drink them. The person who buys the drink may not necessarily be the person who brings in the empty can or bottle for a refund, for example where some people throw their drink cans & bottles away as litter, and other people collect the litter and bring it in for refund. Then there may be people who collect cans & bottles from their homes, but may not be the ones who consumed the drinks. Community groups, such as schools, churches and women's groups may also collect cans & bottles as a fund-raising measure. The key point here is that these people need to know that they can get refunds, and on which items. Cans & bottles are often printed with the refund rate, which may be difficult for small countries to get done by manufacturers where most products are imported. In the Pacific Island Countries, public awareness campaigns through local media or school visits seems to be effective enough. Once the word has gone around, it will become local knowledge and little extra effort at publicity will be needed.

Another point to bear in mind with the public is that the refund must be high enough to get most of the cans & bottles returned, but as small as possible consistent with that aim. See [Element 6, Chapter 2](#) for more details about refund setting.

Unit 2

Operational Models

2.1 CDS Operational Models

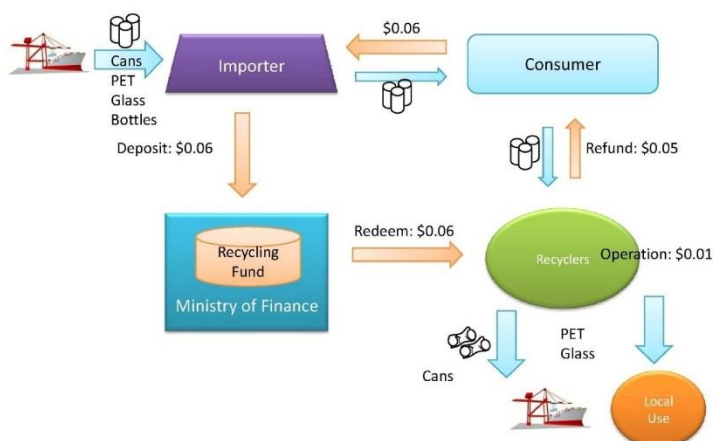
There are two fundamental types of CDS operational models that might work for Pacific Island Countries. One is called the Special Fund model, where the government operates the recycling fund that holds the finances alongside the recycling system, which may be either private or government owned or operated. The other type is the Managing Agency model, where the government simply sets the legislation while the system is run by a non-government Managing Agency and the funds sit outside the government financial system.

Table 4 CDS Operational Models

	Models	Features	Countries where it applies
A	Special Fund Model	Government collects deposits and pays out refunds from a designated 'Special Fund'. Government contracts out material handling operation e.g. collection, redemption, processing, recycling/exporting.	Marshall Islands, FSM, Palau, Kiribati, Tuvalu
B	Managing Agency Model	Non-government Managing Agency collects deposits, pays refunds, and contracts out material handling operation.	Australia, Canada. Model is proposed for Vanuatu and Fiji. Suits larger countries with local beverage industry

Contracted operations are detailed in the [Element 4: Assessing Who Can Operate the System, Chapter 3](#)

A. Special Fund Model

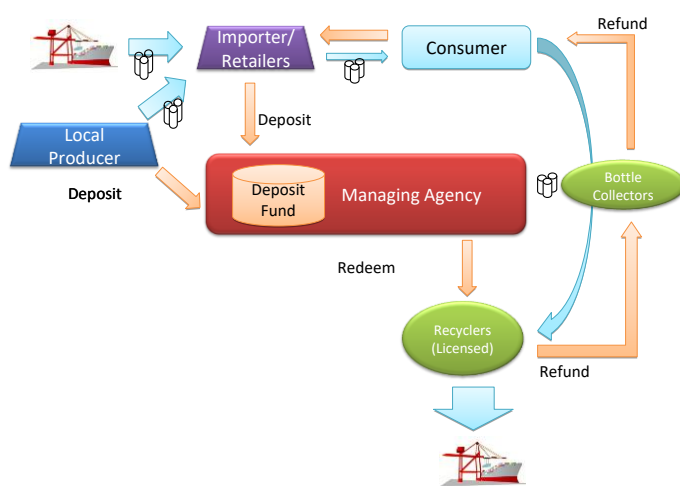


The Special Fund model would suit places where virtually all the target product is imported, such as typical small island states. In such circumstances, deposit collection of any target products is at the time of import, as all imported goods must go through the Customs office. The Ministry of Finance (which usually includes Customs) operates the deposit fund as a Special Fund under legislation that creates a separate,

ring-fenced account that only holds deposits and pays out refunds. This is the most viable model for most Pacific Small Island Developing States (SIDS); for instance, Kiribati, Kosrae State and Yap State of FSM, Palau, Marshall Islands and Tuvalu apply this model.

For this model, simplicity is essential: for example there is no need to require the shops and stores who sell drinks to take back empty containers and so pay refunds to consumers at their shops, as this merely complicates things and adds to system costs. For a small nation, the Special Fund should only be paying out to one, or at most two, contractors who operate the material collection system and pay out refunds. This makes monitoring of the fund simple, and makes fraudulent claims - for items that did not really get returned - much harder.

B. Managing Agency Model



The second model suits places where most of the target beverages are made locally, and where the country is large enough that it has a sizable population and a local manufacturing base of drinks. The Managing Agency is set up through regulation, but with close involvement of the local beverages industry - to take responsibility for the waste generated from their own products.

The Managing Agency manages the finances and collects the deposits from producers (manufacturers and importers), pays out refunds to the public, and contracts a business to run the material handling operations such as collection, processing and recycling.

The Managing Agency model does not currently exist at the level of small island states in the Pacific, but at the time of writing is under development in Vanuatu. It is the model used in larger economies such as Australia and Canada, where industry is sufficiently developed that it can accommodate the requirements.

This approach provides more flexibility to set the deposit rates, as the deposit is the refund plus the Handling Fee and local industry can be involved in discussions around Handling Fees. However, it is recommended that two key parameters be set by the legislation: a target recovery rate, and the refund rate. These two parameters will ensure that the system remains accessible to consumers and acts to remove significant materials from the waste stream. The regulating government agency has to oversee the operation by the Managing Agency to make sure the system operates as it should for all key stakeholders.

Unit 3

Legal Arrangements

3.1 legislative Structure

When developing legislation of Container Deposit Scheme, it is essential to review all the existing legislation relating to waste management, the environment, and taxation and finance. The followings are points need to be in mind at starting point of legislative work:

- The existing legislation must be carefully looked at to see if there is any specific mention of the ability to regulate deposit and refund systems, which can be found in the regulatory powers provisions of some Waste Management Acts.
- It may well not be feasible to create a waste deposit regulation by simply using the broad powers to regulate typically found in an Environment Act; and this may be considered as poor law making by the Office of the Attorney General.
- If a separate, ring-fenced revolving fund is to be created, such as in the small island state Special Fund model, this will need to be created using provisions under existing government financial management acts and will almost certainly require its own Act, or be part of a new Act. If no provision exists in any existing legislation to create a Government account that is separate from the General Account, then this may first require amendment to an existing financial act. Getting a clear idea of the legislative pathway is essential early on, even if the details are worked out later once the system design is clearer.
- It is essential to keep any CDS Act as simple as possible for small island states, whilst the detail is placed in the Regulations. There will need to be a penalties section in the legislation for those who do not pay deposits, or those who try to scam the system.
- There is no need at all to write anything into any legislation that tells business that they must increase selling prices, or by how much; the deposit is just another cost of the product. For example, just as when the price of oil goes up, the price of shipping the product goes up, so the retail price goes up. Let business set its own selling prices, as it chooses, and as it sees fit. Some systems legislate that the consumer has to have the deposit amount stated separately on any receipt, but this is quite an unnecessary complication for small island states; in fact, the more invisible the deposit is, the better the system looks to the public.

3.2 Legislative Approaches for the Two Models

All Container Deposit Schemes will require legislation of some type for any model. This is necessary to ensure compliance with the scheme by all importers and manufacturers. As seen before, there are two main types of operational model, one with government managing a 'Special Fund', and one where

industry operates the system using a 'Managing Agency' model, and these two systems need different legislative approaches.

3.2.1 Special Fund model

The first type, the 'Special Fund' model, where the government collect the deposits and pays out the refunds, is fairly simple, and applicable where most – or all – target products are imported. The key legislative points are: 1) to empower a government agency to collect the deposits, and 2) to set up a dedicated, ring-fenced fund that holds the money and pays out the refunds.

The fund itself will inevitably be managed by the Ministry of Finance – the government Treasury – and as usually the Customs Service is a division of the Ministry of Finance, it is best if Customs is the deposit collecting agency, especially where most product is imported as in small island states. As Customs is collecting money daily, and paying this into the Ministry account, the operational procedures for this are simple and mostly already in place.

However, the fund itself must be separate from the usual government General Revenue accounts, and the administrative vehicle to achieve this is a 'Special Revenue Fund'. The actual name used will differ from place to place, but it will almost certainly be found that in the national finance laws there are provisions to set up Special Funds, which are ring-fenced accounts separate from Government general revenue and expenditure. The reason a separate account must be used is that the fund must not be constrained by national accounting issues, such as expenditures from the fund only being possible if they are part of an annual budgeting process, and also to maintain the integrity and support of the participants, and ensure that funds are not used for other Government expenditures.

Any deposits paid into the fund must be paid out when a valid claim is made. If the fund automatically retains some portion of the deposit, as happens in some places, this can be considered a tax measure. Taxation must usually only be done under the provisions of taxation and finance laws, and not by stealth through automatically holding on to part of the deposit in a systematic manner. This approach can even be considered unconstitutional, depending on the country.

Examples

- **Kiribati**

A clear example of the approach for Special Fund model can be found in Kiribati, with the Special Fund (Waste Materials Recovery) Act 2004. The Act itself primarily sets up the recycling Special Fund, and provides for the general powers of government to collect deposits into, and pay out refunds from, the Special Fund. The Special Fund is administered by the Minister of Finance. But it does allow the Minister of Environment the power to create Regulations under the Act. It is in the Regulations that the target materials are described, and these include aluminum drink cans, PET drink bottles (including cooking oil bottles) and lead-acid batteries.

Two schedules are provided in the Regulations: the first lays out the deposit that must be paid at import; the second the refund that must be paid out, and any conditions of refund, such as that the items must be clean and whole. The Regulations also provide for the Minister of Environment - the

nominated 'Recycling Agent' - to contract out the actual functions of material collection of recycling and public refund payment. Both pieces of legislation are reasonably short and concise, always a good thing in lawmaking.

- **Marshall Islands**

In the contract between the Ministry and the recycling contractor, who is called the 'System Operator', further details are dealt with. For example, that people must be paid at the time of bringing in their items for the purpose of recycling, and that the materials must be exported. In the Marshall Islands, the contract between the regulatory agency, EPA, and the System Operator/ Waste Operator (MAWC) allows export of the collected materials to be suspended, and alternative measures negotiated if the recycling value falls so far it is too costly to export it. This tiered approach allows detail to be placed further down the hierarchy of 'rules' which makes it much easier to change the rules as is seen fit, depending on how the system works; amending an Act requires going back to Parliament, Regulation changes can usually be done by Cabinet with the required gazetting process, but a contract can be changed by the Parties.

3.2.2 Managing Agency model

The second approach, where the local industry sets up a Managing Agency to run the recycling fund, simply requires a law that states that anyone importing or manufacturing a target product must have in place a system to buy it back at the end of its life. If an importer/manufacturer does not have such a system in place, then they cannot sell that product. These are true Product Stewardship schemes¹ that put the onus of recycling and waste recovery onto the producers. Legislation of this type in a developed economy is quite simple, and industry has no choice but to comply or they cannot sell their product; but if the 'rules' are kept as simple as possible, this does allow business to – ideally – develop the most efficient model to recover the materials. Such 'rules' are usually in a regulation, and in their simplest form might only include two parameters: identifying which products must comply, and identifying a target rate of recovery.

The target rate is essential, for without a target rate, then business can do things such as set up a single collection point that is rarely open, and so hard for the public to get refunds, but still claim to have met the legislative requirements. This scenario may allow business to make more money by claiming that the deposit has increased prices, even though recovery rate has only marginally improved. It is advisable that at least a third parameter is included in the rules, and that is the public refund rate.

Whilst the legislation can be simple and light, it must be strong enough that significant penalties will be applied to those who do not follow the rules. For example, if a local bottled water producer is paying deposits on their production, but someone else is importing bottled water and not paying, then the local company will understandably feel disadvantaged, and rightly so. Government must be prepared to penalize any stakeholder who does not pay deposits. The upside is that those who pay can be expected to draw attention to those who do not, but government must play the role of policing the system. The Managing Agency model also relies on cooperation amongst the key industry players, and

¹ Product Stewardship is an approach that business supports addressing burden of their products on environment and health throughout the product life cycle.

in small countries this can be a challenge where the market is small but highly competitive, with a small number of participants.

With the Managing Agency model, there is no financial management by government, so the enabling Act may be very simple, and indeed the relevant legal language may be included into an Act dealing with environment or public health etc., but any Act must contain the specific power to regulate a deposit/refund system, also called a 'Product Stewardship System' (PSS). The Regulations will deal with details regarding which are the target items, and should specify both a refund rate and a target recovery rate. A deposit rate is not required to be specified, as the Managing Agency can set this, and adjust the deposit over time, in order to meet the target recovery rate. Remember that the deposit rate is the refund + the Handling Fee. The target rate is essential to avoid a perverse incentive occurring, whereby deposits are paid but it is hard for the public to get refunds, so allowing unredeemed deposits to build up, which can possibly be paid back to key industry participants.

The simplest example in the region is probably the South Australian system, which has been running for over 40 years. The relevant clauses – only eight – are part of the Environment Protection Act, and are clear and simple.

3.3 Contracts and MOU

Once legislation is in place, there will need to be agreements between the key partners before the CDS goes operational. For example, in a Special Fund CDS model, there might be four main participants: the Ministry of Finance who is the financial manager for the recycling funds; Customs, who is collecting the deposits at import; the Ministry of Environment - or similar body - who is the overall regulator, and may be nominated as the 'Recycling Agent' in the legislation; and the business operating the material collections or recyclers, who also pays out refunds to the public, often called the 'System Operator'. There needs to be clear written agreements between all these partners about who is responsible to do what, when and how, to ensure the system runs smoothly.

For example, the System Operator will be paying refunds to the public for the cans & bottles bought in for recycling. The System Operator needs to be able to make regular claims against the recycling fund, to claim the full deposit amount back so that they have a good cash flow to keep the system working. A typical small island CDS will pay out thousands of dollars each week in refunds, and the System Operator needs to be sure that claims against the fund will be paid to their business promptly and regularly. This can be included in the System Operator contract with the Ministry of Environment. Similarly, the Ministry of Finance needs to be sure that all claims are made in a standard format and include specific information, so that the claims can be processed correctly and checked. This procedure for making claims needs to be clearly written in any agreement. Customs Officers need to have clarity in applying the requirements to importers to pay deposits. The regulator needs to be sure that data is collected from the system very regularly so that they can monitor the recycling operation and makes sure that everything is working as it should.

These issues, and many others, can be dealt with through contracts between the parties, or through a Memorandum of Understanding (MOU) type of document. The contract between the government and the System Operator in the Special Fund model may not require either party to pay contract fees to

the other, being a 'right to operate the system' contract, and so may only need meet some very simple government procurement rules.

For the Managing Agency model, the Managing Agency (MA) itself is the central contracting party, and will have 'Producer Agreements' with local beverages manufacturers and importers, whereby they agree to pay the deposits, and the MA takes on the requirements to collect the waste and pay out the refunds. The MA will have a contract with a 'System Operator' recycling business to pay out refunds, and process the recyclable materials. The MA may also have a contract with a financial management firm to do all the accounting around fund income and expenditure. But the key point is that much of the detail of how the system works is included in these contracts and MOUs and Producer Agreements. In this way, details can be more easily changed if required to make the system work better, rather than putting too much detail in regulations and so making it hard to change details of the system.

Chapter 2

Designing a Viable CDS and Conducting a Feasibility Study

Feasibility Studies

A Feasibility Study is the initial design phase of system, and includes research regarding the existing situation in the country in question. A study should also identify how much financial and project resources must be dedicated to implementing the CDS. A study determines the key factors that must be considered, and makes estimates and recommendations so that politicians, business and the public can see how the system might work once operational.

In this Chapter, we will look at what needs to be studied, and how. Study methods are also detailed so that a study may be able to be worked out locally, with or without the help of consultancy services. Some of the points explained in this unit must be answered in order to draft the legislation. Legal arrangements are explained in [Unit 3, Chapter 1](#).

CDS FEASIBILITY STUDIES in the PICs

In the Pacific Islands, most of the current systems had a feasibility study conducted. For example, for Kiribati the study took place in 2002/3 and this led on to the setting up of a recycling shed and baling equipment on government land. Working with the Ministry of Environment and the Office of the Attorney General, the legal framework was developed over many months. Meanwhile, the UNDP financed the operation of the Materials Recovery Facility (MRF) so that the huge amount of existing aluminium drink can litter could be bought up at 2¢ each, and by selling those aluminum cans the project created its own income to help project finances. This in turn allowed the development of the financial and monitoring systems, use of which became part of the conditions for the contractor who took over from the project once the system was fully legalized and deposits started being collected by the government. Without the initial study of local conditions, such as the costs of shipping & labor, and finding and then setting up an MRF, the system could not have come into operation.

Feasibility Studies were conducted for all states of the FSM and the Marshall Islands in 2005/6, and these led to new systems going into operation in 2007/8 in Kosrae and Yap. The RMI had more study work undertaken in 2014, which led to a Cabinet approval to go ahead with legislation in 2017. However, because careful work on developing the legislation, based on local conditions, had not been done, the legislation required amendment in 2018 in order to make it practical to operate the system. This provides a clear example of why it is important to do the careful preparation work, and design all main parts of the system, before passing the legislation and starting operations.

KEY ELEMENTS of CDS DESIGN

1. **Deciding the Target Products and Estimating Waste Generation:** Situation analysis of any existing waste recovery, waste management, and recycling, along with analysis of both local production quantities from businesses and import data from Customs.
2. **End of Use Products Management and Material Recovery Facilities:** How the materials collected might be processed for recycling, reused locally, or otherwise disposed of.
3. **Mapping the Collection/ Redemption Points:** Determining where the Collection Points might be sited so the public can bring items in to get refunds.
4. **Assessing Who Can Operate the System (System Operator):** Understand what capacity is needed for those who operate the physical system, including collection, processing, export, and finance.
5. **Estimating the Running Costs:** Identify how, and at what cost, the materials will be counted, processed and exported for recycling or other disposal/ repurposing.
6. **Determining Refunds and Deposits:** Understanding the impact to the public and business of different levels of deposit and refund, so that the impact is as small as possible whilst maintaining the incentive for consumers to bring the target items back.
7. **Setting Up the Fund Management System:** Provisions that protect the Recycling Fund, such as keeping it apart from any government revenue accounts, and the reporting system for claiming refunds.
8. **Assessing Legacy Wastes:** Estimation of the potential number of items that may be returned for refund but on which a deposit has NOT been paid as they were already in the country before system start up, for example existing litter.
9. **Data Reporting and Implementation Monitoring:** Developing the systems whereby data is recorded and reported to the Fund manager and the regulating agency.

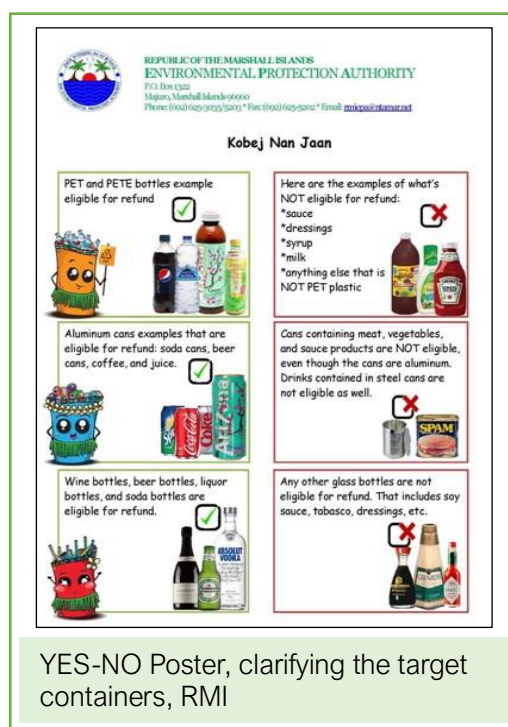
Element 1

Deciding the Target Products and Estimating Waste Generation

1.1. Which Beverage Containers are to be part of the System

Deciding what types of beverages are to be targeted, and what for, is something that must be done early on in the design process. The majority of beverages in small island states come in either glass bottles, aluminium cans, or PET plastic bottles. There are other types too, such as liquid paperboard (LPB) 'tetrapak' type cartons, and some plastic bag sachets. Surveys of stores, importers and local manufacturers of beverages will soon indicate which type of beverages are most common, and those are the type to target for a CDS. As beverages are consumed daily they are easy for the public to pick out of the waste stream, and easy to identify by the public, businesses and customs at import. It is important that the target items are easy for both business and public to identify, so people understand what has to pay deposits and what will get a refund.

Where promoting recycling is a primary policy purpose for introducing the container deposit scheme, the recyclability of the materials collected is an essential part of determining the target containers. Diversion of waste from landfill is an essential consideration. For example, glass bottles may not be recyclable on a small island, nor economically viable to export, but can be crushed and reused locally in concrete or for roading applications, so keeping them out of landfill.



1.2. Readiness for Recycling

Among beverage containers, aluminum cans have a great advantage for recycling in that they are easily processed and exported, have a comparatively high value, and a profit can be made from exporting them for recycling. The other common materials of beverage containers are PET plastic, and glass, although neither usually has any significant monetary value when it has to be shipped out of remote Pacific Islands, unlike aluminum. If plenty of aluminum is present in the waste stream, then this can effectively be used to help make the recycling system pay for the recovery of PET plastic and glass too, as some of the profit from the aluminium can go to exporting PET. There are other materials used as beverage containers, but their proportion as part of the whole is typically low, and they are not usually recyclable or have any value for export.

1.3. Exemptions

- **Size**

There are usually limits on container size of the target beverage containers. Some places such as the Marshall Islands have a 1 liter limit, but this means that larger plastic bottles are not included. The decision was made based on a survey in Marshall Islands, finding that beverage containers over 1 liter are mostly drinking water locally filled in one or five gallon jugs which are reused. A good size for a limit can be three liters, as soft drinks do not usually come any bigger than about 2.5 liters. Glass bottles over two liters are rare, and will generally find good re-use options where they do exist. Aluminium cans rarely exceed 500ml in size. Some wine can come in cartons, where a cardboard box holds a plastic bladder, and these can be up to three or four liters, but may not be part of the target beverages.



- **Milk**

Milk is often excluded from CDS on the grounds that it is a basic food rather than a consumer item. Liquid milk in plastic bottles is unusual in PICs, where liquid milk is usually UHT(Ultra-Heat-Treated) and in cartons, so whilst in temperate developed countries milk is considered a basic food and may be exempt, this may not be such an issue in PICs, so it depends on local perceptions.

In places where a beverage manufacture operates their own bottle-buy-back system for refilling the bought items, these items should not be hampered by the government run CDS. Target items locally manufactured are levied at the time of domestic sales, so that beverages produced locally for export are thus exempted.

1.4. PET Preforms

Preforms, the small PET bottles that are blown into full size bottles for local filling, can generally be excluded from legislation requiring payment of deposit at import. This is because a container full of preforms may contain a very large number - millions - and place an undue cash flow burden on local manufactures if they have to pay deposits on a preform shipment. Also, a significant portion of preforms do not 'blow' correctly and are rejected. Local bottlers should pay deposits based on wholesale sales that leave their works, not before. However, this is not the case in Kiribati and Palau where preforms were included in the legislation. Kiribati has no local bottlers.

1.5. Generation Amount by Material Type

An important step in any feasibility study is to determine how much of the target materials might be generated each year. This is determined primarily by looking at import data, and any local production figures.

STUDY METHOD

1. Import

For imports, the first step is to consult the national customs tariff and see which are the relevant Harmonized System (HS)² numbers on the target items. You should be aware that the target materials will not be described for beverage containers, but only the type of beverage, i.e. the liquid inside. Most beverages fall under Chapter 22 of the HS tariff. The first six digits of the eight figure HS tariff is internationally common, and only the last two digits are applied locally. Thus 22.01.10.xx are all drinking water, 22.02.10.xx applies to soft drinks ('water with added sugars'), 22.03.00.xx is beer, and so on. The last two digits might be used to describe 'beer in glass' or 'beer in cans' for example. This aspect can be useful where applied in a national tariff.

HS Tariff Sample

TARIFF ITEM	DESCRIPTION	UNIT QTY	IMPORT DUTY RATE	EXPORT DUTY RATE	SITC CODE
22.01	Waters, including natural or artificial mineral waters and aerated waters, not containing added sugar or other sweetening matter nor flavoured; ice and snow.				
	-Mineral waters and aerated waters				
2201.10.10	---Mineral water/drinking water	l	4%	Free	11101
2201.10.20	---Aerated water	l	25%	Free	11101
2201.90.00	-Other	l	25%	Free	11101
22.02	Waters, including mineral waters and aerated waters, containing added sugar or other sweetening matter or flavoured, and other non-alcoholic beverages, not including fruit or vegetable juices of 20.09				
2202.10.00	-Waters, including mineral waters and aerated waters, containing added sugar or other sweetening matter or flavoured	l	25%	Free	11102
	-Other :				
2202.91.00	-- Non-alcoholic beer	l	25%	Free	11102
2202.99.00	-- Other	l	25%	Free	11102
2203.00.00	Beer made from malt	l	\$0.7045/L	Free	1123

(Source: FSM Customs Tariff 2017)

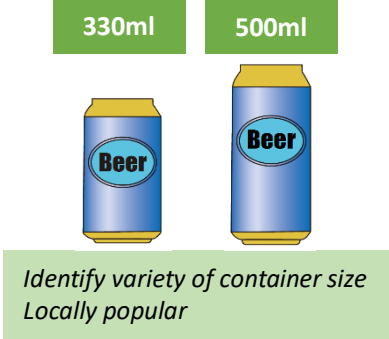
Once the HS codes for the target materials are identified, import data needs to be requested from either the Customs service or the national statistics office, and then inspected carefully. The import data will **not** tell you the number of beverage containers. It will only tell you quantity - usually in liters, but possibly tonnes - and value. The liter amount needs to be converted into a 'number of containers' amount, and this requires some intelligent estimating. The typical size of a beer can or bottle is 330ml in most places, although it can vary, but a figure of three beer bottles or cans per liter can be used to make a reasonable estimate of the number of beer cans and bottles imported per year. For PET bottles, which usually contain drinking water or soft drinks, one must go around a large number of shops and see what sizes are common in the country, then make an estimate of a number of bottles per liter. This takes a bit more effort; a simple estimate can be made using one PET bottle per liter imported, and this will give a general

² The Harmonized System (HS) is an international coding system used to identify different items in customs tariffs. Different products have different codes, and codes are up to eight numbers.

indication of quantities as long as the products are reasonably well spread across a variety of sizes. Wine bottles are almost always 750ml, and so 1.33 bottles per lite.

Conversion to the number of containers

	330ml	500ml
Case of Beer		
1 Litter =		
..If 330 ml cans/bottles ⇒	3	
..If 500 ml cans/bottles ⇒		2



*Identify variety of container size
Locally popular*

2. Local Manufacturing

For local production figures, it is necessary to go and visit the local producers of drinks, and try and get some general estimate of annual production. It is important to recognize that this information may be seen as commercially sensitive, especially where there is competition between local manufacturers, and that aspect needs to be respected when asking for information. So any information about local production should be aggregated in any feasibility study report, so that individual company data is not published to respect that confidentiality. Also, production may vary from year to year of course.

Element 2

End of Use Product Management and Material Recovery Facilities

2.1 How to Process the End of Use Products for What Purpose

Container Deposit Schemes are used as part of the product life cycle management, so that collected materials have a system in place for recycling or proper disposal. Existing recycling activities in a country should be surveyed in terms of owner, operation capacity, and materials handled in order for the government, or others, to plan out the necessary investment for establishing the system of end of use product management. Treatment methods and their purpose are discussed below.

At Collection/ Redemption Points

- All redeemed items must be stored in a secure way to prevent them from being brought in again to a Collection Point, for another refund. Thus immediate crushing/ baling at the Collection Point is potentially useful for securing redeemed materials from being refunded twice. Where a Collection point cannot do this, materials should be transported to the MRF straight away, or securely locked up until they can be moved.

At the Material Recovery Facility (MRF)

In PICs, an MRF is usually also a Collection/ Redemption Point

- Treatment methods depend on material types, and the required conditions and quality vary depending on the material types. For aluminium and steel cans, baling is inevitable for shipping. Only the same materials must be crushed together into a bale, so it is important not to mix different materials in the baling press. The baling press is the machine that crushes the cans and bottles into a block. The block is then put inside a shipping container for export.
- For PET bottles, the same baling machine for cans can be used, but a specialized machine can be better, one that allows strapping of bales. PET flaking, which is practiced in Yap State, is high in shipping efficiency as more PET bottles can be processed into a shipping container through flaking than baling, but bags are needed to hold the flake.



MSP-200 (MITO) Can Baling Machine, RMI
1 block=3,000 cans, 10 blocks/hour

- Glass bottles must be crushed. These are not usually exported due to the low value of scrap glass, but the crushed glass can find a good use in non-structural concrete as a sand substitute, for filling in potholes for roading, or landfill cover or internal roading in a dumpsite or landfill. In Palau, a Glass Recycling Project by Koror State Government smashes glass into cullet, and then it is put into a melting machine for crafting products such as ornaments or glass bowls. An estimate of the amount of glass bottles expected to be processed needs to be made when setting up the system in order to size a suitable crushing machine. Some islands have very low glass bottle numbers, and so it may be possible to use quite a small machine. Usually quantities depend on how much beer is sold in glass.

2.2 Efficient Use of a Baling Press

A 'cycle' of the baling press is the time taken to crush the materials once the press is full. The usual way is to fill up the press, and then operate the machine to produce a bale. For aluminium cans, this usually produces a good size bale that can be put straight into a container. For PET bottles, it may be found that the press can be opened without ejecting the bale, more bottles put inside, and another cycle operated. It depends on the size of the bale produced, and how heavy, and easy to handle, it is.

It is important to get an average number for aluminium cans and PET bottles in any press cycle. This way, as long as the press chamber is filled before each cycle, by counting the crushed blocks, or bales, produced and in storage, a simple check can be made that the number of cans and bottles refunded is matched against the number of blocks or bales. This also helps with determining when a shipping container full of bales will be ready, and the shipping container can be booked for export as it can be estimated when the next full container load will be ready.

One thing to take care about is that a 40 ft shipping container full of aluminium cans may be greater than the capacity of the local trucks and wharf crane to move the container onto a ship for export in some small PIC ports. These are the sort of details any System Operator will have to think through when setting up.

Container densities for aluminium cans will vary from around 10 tonnes in a twenty feet equivalent unit (TEU) when using a small baling press, to around 17 - 18 tonnes with a big scrap metal press. For PET bottles, which are harder to bale and less dense than aluminium, the aim is to get at least 8 tonnes per TEU, and ideally 10t if a big press is available. PET bottles can be shredded, and this will increase the density for shipping, but it does require bags to put the shredded PET into, and also a forklift to handle big sacks, which may be too heavy for manhandling.



Filling shipping container with baled cans, RMI
(Copyright: Mr. Kanazawa Masafumi, JICA
Volunteer)

Table 5 MRFs for CDS in PICs

Countries/ States	Types and Capacities
Kosrae, FSM	<ul style="list-style-type: none"> ■ 1 RJ mini baler
Yap, FSM	<ul style="list-style-type: none"> ■ 1 baler 20 blocks/ hour (1 block=2500 cans) ■ 2 RJ mini balers 15 blocks/ hour (1 block=120 cans) ■ 1 PET Flake Shredder (Grant aid through Embassy of Japan Grassroots Grant Program) 2-3 ton/day
Koror State, Palau	<ul style="list-style-type: none"> ■ 4 balers (5070HDC, Orwak, TOMRA) 10t of compactor force 7 block/ hour (1 block= 2,000 cans) ■ 3 balers (6040HDC, Orwak, TOMRA) 10t of compactor force 7 block/ hour (1 block=1,800 cans)
	<ul style="list-style-type: none"> ■ 1 Glass Crusher (Donated by Embassy of Japan Grassroots Grant) 1 ton/ hour ■ 1 Glass Crusher 2 ton/ hour
RMI	<ul style="list-style-type: none"> ■ 1 baler for cans (MSP-200, Mito) 10 blocks/ hour (1 block=3,000 cans) ■ 1 baler for PET bottles (MPR-30, Monoi) 0.3 ton/ hour
Tuvalu	<ul style="list-style-type: none"> ■ 2 RJ mini balers 15 blocks/ hour (1 block=120 cans)

(Source: J-PRISM II)

Element 3

Mapping the Collection/ Redemption Points

3.1 Mapping Collection Points (Redemption Center)

Collection Points provide people with access for bringing back the end-of-use products and getting paid in cash or check. Locations and opening hours of Collection Points affect the motivation for the public to take action. Most systems globally have a 'return to retail store' approach, and also require items to be marked for refund, or retail stores are equipped with Reverse Vending Machines. In the Pacific Islands, a few centralized Collection Points can be mapped out depending on the population in each area, and will soon become known by everyone, and in the same way everyone will learn that end-of-use beverage containers can be exchanged for cash.

Ideally, the location of collection points will be in places that are easy for the public to get to, and in a country with many outer islands, a Collection Point near the main inter-island shipping wharf, in the capital city, is always a good place. Collection points can be mobile, using a truck, where a cashier goes along in the truck and pays out money for cans as they are measured and loaded. Satellite Collection Points can also be open for short periods each week, where having them open every day would be a waste of time and money. People soon learn the times when a collection point is open, and will arrange to come at that time. A central collection point can be open every day at the main Materials Recovery Facility (MRF) where the cans and bottles are crushed, and this is usually where big collectors, such as from bars and hotels, will bring their cans and bottles.



Refund value (10¢) is printed on the label, Australia



(Copyright: Mr. Alice Leney)

See [Kiribati Case Study](#)

Kiribati located four shipping containers in public places as satellite collection points along the 40 km road, which provide people with convenient access to CDS.

It is essential to remember that most of the consumption of drinks takes place in the town and city, and so the system should be primarily designed to service that population. There is little point making

a complex system that serves everyone equally when a simple one would serve most of the people and recover nearly all the waste. A country such as Fiji has a number of town centres, and any system should focus on servicing those people, and on logistical pathways that already exist. For example, some tourist resorts may be in remote islands, but high consumption of beverages usually takes place at the resorts, so a logistical system exists to take many drinks to the tourists. This same system can be used to bring the empty cans & bottles back, as can be seen in Fiji with the Fiji Bitter beer bottle collection system. Conversely, a remote mountain village where everything is carried in by hand will probably not consume large quantities of beer in glass, and the few drinks that are bought in to the village will likely be in aluminum cans as these are light, don't break, and much easier to carry.

3.2 Counting Devices at Collection/ Redemption

Deposit collection is generally straight forward, as the money comes in large payments from importers or local producers. Refunds, however, comprise a large number of small payments. Therefore, items need to be counted easily and efficiently at Collection Points, and where beverage containers are involved, these can be several hundreds or thousands from each person bringing them in.

Hand counting of individual beverage containers is not only time consuming, but likely inaccurate; a simple method developed in the Pacific has been the use of wire baskets of a set volume, and these are made to contain a certain number of cans & bottles: for example, a basket used in the Marshall Islands typically holds 500 aluminum cans, or 300 PET bottles, when filled flat across the top. Whilst the exact number will vary slightly, testing has shown that the difference is rarely more than about 2% (10 items in 500) and the public has accepted this method as a quick and easy way to measure the items, and more accurate over time than hand counting, where numbers can easily be forgotten by the person counting when in the middle of a big count. The sides of the baskets are made of wire grid mesh, and counting the number of grids can give a figure to use when the basket is only partially filled.



Some systems in developed countries use machine to count the cans and bottles, but this involves high capital cost, and also leaves the system exposed to breakdown if the technology fails. Technicians to repair such machines are usually not available in PICs, so they have to be flown in at great expense. Simple methods of counting cans and bottles, with no technology to break down, are therefore preferable in small PICs. In Palau, however, the Redemption Center operated by Koror State Government installed a counting machine, which contributes to counting accuracy and minimizes the risk of cheating.

Using weight to measure cans and bottles leaves the system open to an easy fraud, as it is a simple matter to add a little sand or a small stone to each can and so increase the weight. This results in more money being paid out than should be, as it appears that there are more cans than there really are. This is particularly a problem with aluminium cans as one cannot see inside them. Another problem occurs when the cans are sold, as the overseas buyer finds that they bought sand or stones at scrap aluminium prices! Not only that, but the sand and stones make a big mess of the refining process. The usual result is that the buyer no longer buys cans from that country or recycling operation. Thus, it is very important that cans and bottles are clean, and that there is no incentive for people to put sand or stones in the cans and bottles to increase weight, and so get more money.



Counting machine for cans and PET bottles, Koror State, Palau

Element 4

Assessing Who Can Operate the System (System Operator)

4.1 Who Runs the System: Collection Points (Redemption Center) and Material Recovery Facility

Who will run the Collection Points (or 'Redemption Centers') and/ or the Material Recovery Facility, and the costs involved in running these, is another important factor to determine near the beginning. The operator of the physical systems for redemption and/or material recovery is usually called the 'System Operator' and they will usually operate under a contract to the formal government agency, ministry, or any Managing Agency that is charged with regulating or running the system in the legislation. Two examples of this approach can be seen today in the Pacific Islands: one where government takes this recycling function on, and another where the system is contracted out to a private operator.

Table 6 System Operators in PICs (as of 2021)

Countries/ States	Operation	System Operators/ Contractors	
Kiribati	Collection& redemption, processing, and export	Kiribati Recycling	Business entity
Kosrae, FSM	Collection& redemption, processing, and export	Micronesia Eco. Corp	Business entity
Yap, FSM	Collection& redemption, processing, and export	Island Paradise Metal Company	Business entity
Palau	Collection& redemption, processing, and domestic recycling (glass bottles)	Koror State Government	Local gov.
	Collection& redemption, processing	Belau Garbage & Scrap Company	Business entity
	Export (metal cans and plastic bottles)	Palau Waste Collection Company	Business entity
RMI	Collection& redemption, processing, exporting	Majuro Atoll Waste Company	State-Owned Enterprise
	Collection& redemption, processing	Kwajalein Atoll Local Government	Local gov.
Tuvalu	Collection& redemption, processing, disposals, and export	National government	National gov.

(Source: J-PRISM II)

4.1.1 State-Owned Enterprise/ Local Government

In the first case, we can see in the Marshall Islands that the State-Owned Enterprise (SOE) Majuro Atoll Waste Company (MAWC), which is the waste management entity in the capital Majuro, runs the business of waste collection and final disposal. MAWC is engaged for the CDS under a contract with Environmental Protection Authority(EPA) as the actual System Operator although the nominal

legislated 'System Operator named in the legislation is the EPA. MACW operates the physical system, collecting cans & bottles, paying out refunds to the public, processing materials, and selling them overseas for recycling, or domestic reuse. MAWC has a recycling shed that has been built and equipped with the assistance of Japanese aid, and MAWC makes money from the recycling system which is used to help finance other parts of its waste collection operations. The other target area for CDS in Marshall Islands is Kwajalein Atoll, where the Local Government (KALGOV) is another System Operator under a contract with EPA.

4.1.2 Private Company

In the second case, in Kiribati, a private company operates as a System Operator under a contract with the Ministry of Environment. This approach can be also seen in Yap State and Kosrae State where a single private company is contracted to run the system. In the case of Kiribati, the private company does not own the equipment or the recycling yard. The land on which the recycling takes place is owned by the government, and the equipment was installed and paid for by both donors and money generated by the original project which set up the system. The contract is essentially a service contract, and this results in two important things: first, the company did not need to invest in the land and equipment before starting to operate the system, which would probably not have happened due to the high capital cost of start-up; and second, if the company fails to perform its contract well, the government can easily get another company in as System Operator because all the equipment and land is owned by the government. If the System Operator owned the recycling yard and the balers, then in a small country it is unlikely that there would be another company who also has that equipment and is ready to take over.

See [Palau Case Study](#)

You will find a case in Palau where there are both local government and a business entity operating Redemption Centers located in Koror State. What happens when Redemption Centers are operated by different entities? See the Palau case study.

4.2 Financial Capacity of System Operator

Regarding the System Operator's role and capacity, the contractor must have sufficient cash capital to pay out refunds, and then make claims against the recycling fund. It is highly inadvisable for the System Operator to be given money up-front with which to make refund payments.

The System Operator must make it as easy as possible for people to bring in items for refunds, and the financial flows must be such that the System Operator only makes money on items they already paid out refunds on, and does not somehow end up being paid all the deposit money and paying out refunds from that. If care is not taken, it can be easy to create a system whereby the System Operator has an incentive to make it harder for people to bring in their items for refund, as they can make more money like this with less effort. Such instances have occurred before in the Pacific.

4.3 Keeping the System Simple

It is important to avoid design elements that may make a system hard to operate. A good example of this is that many developed country CDS require that any retail store that sells a drink must take back the empties and pay out the refunds. Whilst this may work well enough in more developed places, in the Pacific it will certainly add to costs and complications about operation, as stores are not set up to count cans & bottles brought in and make payment to the customers, and transporting empties back to the MRF may be difficult for stores. Also, any requirement that the store who actually sells the product must be the business paying the deposit means that the deposit collection effort is vastly increased, as a great number of stores have to pay deposits, and this increases the likelihood of some deposits not getting paid, and the system crashing through cash flow problems. Alternately, if stores are paying refunds, then there are multiple claims being submitted to the Recycling Fund, making the accounting of the Fund a difficult and complicated task. Fraudulent claims also become much easier to make when a large number of claims are being processed each week.

Thus, in small PICs, it is a great advantage to make only the importers and local manufacturers of drinks pay the deposits, and have a single 'System Operator' or perhaps two, who pay out refunds. There is nothing to stop bottle collectors, such as in Fiji and Palau, acting as 'middle men' and collecting cans and bottles at one price, and selling them on the System Operator at a slightly higher price. This is normal economic activity and can work very well in these systems.

Element 5

Estimating the Running Cost (Handling Fee)

5.1 Handling Fee: Running Cost for Redemption (Collection) and Processing

The study must also make estimates about collection costs as well as processing costs of materials collected. The costs of things such as machinery operation, shipping, labor, and collection costs may differ depending on the number of collection points, frequency of opening times, methods, etc. For the processing, the materials themselves will not usually be worth much, except aluminum cans, so the difference between the actual cost of running the system and the expected income from sale of materials needs to be calculated. This cost can be divided across all the expected number of items coming in for refund, or separately determined for different material streams. This amount is a 'Handling Fee', and is the amount added to refunds to make up the entire deposit. The Handling Fee might typically be 1¢ - 2¢ per container in Pacific Island countries, but it can also include a fraction of a cent as deposits are paid in single large payments, for example 1.5¢. The Handling Fee can either be calculated so that it is the same for all items, irrespective of whether they are aluminium cans, glass bottles, PET etc., or else a different Handling Fee can be applied to different beverage container types. This is the sort of detail a Feasibility Study might look at. Some examples from other places are now provided below to help illustrate these points.

In the North West Territory of Canada, the government runs a system for only 40,000 people spread over a huge area. Here we see that Handling Fees are typically high, with a beer bottle paying a 13¢ handling fee on a 10¢ refund (giving a 23 ¢ deposit), as a glass bottle is heavy and expensive to move. But an aluminum can pays only 8¢ Handling Fee on a deposit of 10¢, giving a deposit of only 18¢. As the can is worth about 2¢ each when sold for recycling, a bias is created to encourage can use, which is good, and the end result is that 97% of aluminum cans come back, but only 82% of glass bottles.

In the Northern Territory (NT) of Australia, a similar area of low density population - which is often the case in PICs - the system is operated by four different companies, and the handling fees are negotiated with collection points depending on where they are. This approach would mean that producers, who pay the deposits, are spreading the cost of remote collections across all consumers, which is a fair way to go, and may help remote people gain refunds for the materials. The population of the only city in the NT, Darwin, is around 150,000 whilst the population of the entire NT is only 200,000, which mirrors a typical small Pacific Island state situation of a single city with most of the people, and everyone else spread around very sparsely.

5.2. Bailing Machine

A significant determinant of real costs is the density of bales of cans and PET bottles that can be created: dense bales require a bigger, stronger press, that costs more to buy and needs a large, strong electricity supply. But once installed, it will crush cans and PET bottles tighter, getting more items into a shipping container for export, so decreasing unit shipping costs. The baler size needs to match material flows to some extent. If the baler is too big then it will be underutilized and capital cost is high,

but too small a baler will add costs overall in labor and shipping, so decreasing profit to the operation. Big balers also produce large bales which may need a forklift to move them, so adding to costs of set-up and operation. Bales that are easy for one or two people to handle may be best for small PIC operations.

Element 6

Determining Refunds and Deposits

6.1. Setting Refund Value

The purpose of the refund is to create an incentive for the public (the consumers) to return the empty beverage containers for recovery and recycling. It needs to be simple and clear to the public how much they get as a refund. The followings are key indicators to look at when setting a refund rate.

- **Local Value**

The refund needs to be enough money to make it worth the effort of returning the cans & bottles, and so the amount is relevant to local values. For example, in Kiribati 4¢/container (five units for 20¢) was enough in the past to get items collected, but over time that has become less valuable and returns have dropped a little. In South Australia the refund was lifted from 5¢ to 10¢ after which many more cans & bottles came back. But the refund need only be big enough to get most of the cans & bottles returned. Making the refund larger adds to the price of the drink, and so keeping the refund at a 'just enough' level is important to minimize impact on prices of drinks.

- **Impact on Sales**

Large refunds are pointless in that they may impact sales by increasing prices too much. If sales are impacted, businesses the public may complain, as they will be seeing rising costs, and no one likes that. Politicians may not then agree to pass the laws needed. So setting the refund to the right level is really important. If a local deposit-refund system exists to refill beer bottles, then that will provide a good indicator of what a suitable refund rate is. For example, in Vanuatu, Tusker glass beer bottles are refunded at 10VT each for refilling, and over 80% of bottles are returned, so it can be seen that 10VT is a good refund level.

- **Accounting**

The refund amount needs to be simple, both for the public to understand, but also to assist payment and accounting. For example, if the refund is 7¢, then this can make the task of monitoring numbers of items collected with deposit payments made awkward. It also means that any cash payment system needs a lot of small change, which can be a big problem if the cashier at the Collection Point has to be constantly be going to the bank to get bags of small change.

- **Local Coinage**

Sometimes, the local coinage is a strong determinant in setting a refund amount. For example in islands that use US currency, a 5¢ refund means that small payouts will be based on either dollar bills or quarters (25¢ pieces), whilst in Kiribati, where they use Australian currency and coins, a 4¢ refund meant that five items could be refunded with a 20¢ coin, and only dollars and 20¢ coins were needed in the

cash box. What is seen, over time, is that refunds are paid out in larger amounts, and the regulations can require that minimum numbers for a refund are multiples of an amount that converts to round dollars. These practical points are very important to inform decisions taken early on in the design process, although the results of decisions may not be seen until late in the system set-up phase.

The refund value will typically be either 5¢ or 10¢ today, with perhaps 10¢ being more likely. 10¢ is a very good refund amount for accounting and system monitoring purposes, as well as being a big enough incentive for the public in most places.

6.2 Setting Deposit Values

6.2.1 Impact on the Selling Price

The deposit is paid by producers into the fund at time of first sale or import, and then becomes added to the price of the product. The deposit includes the refund and any Handling Fee for that beverage container, so it can be seen that the deposit is calculated as follows:

$$\text{Refund amount} + \text{Handling Fee} = \text{Deposit}$$

It is important to allow retailers to decide how they will change selling prices, and not to demand that the specific deposit amount is simply added to the selling price. Let normal market forces decide the prices that retailers charge. Prices for exactly the same product differ between different stores, and it is important to recognize this. Consumers usually do not need to know what the full deposit is. They are generally only interested in what refund they will get when they return the beverage container.

6.2.2 Parameter for Setting Deposit Value

The 'price range' - the variation in the selling price of exactly the same product in different stores - is a good indicator of how 'invisible' the deposit is, as the deposit will be added to the price of the product. Where the deposit is less than the typical variation in price of a product in different shops, then consumers may well not notice much increase in prices as a result of introducing the system. The best outcome is when consumers do not realize that they paid a deposit, but only see that they are getting a refund payment when returning the waste cans & bottles, as this makes them happy. So where, for example, the price of the same beer products might be between \$1.75 and \$2.50, giving a 'price range' of 75¢, then a 6¢ or even 12¢ deposit is not usually noticed in the additional price.

STUDY METHOD

A key output of the Feasibility Study is to determine suitable deposit and refund rates. When visiting the stores to survey sizes of beverage products, a list of the target products with their prices should be made, and put into a spreadsheet to determine price ranges and product sizes.

This spreadsheet should also note beverage container material alongside the product, in particular to identify beverages that fall into Chapter 22 of the tariff but which may not be part of the system.

By going around a good selection of big and small stores one can get a very good idea of the price range of the same product, which can be surprisingly large: it is essential that exactly the same product is compared. Seeing the price variation helps in setting an acceptable deposit and refund rate that becomes invisible as it is well within the typical price variation.

6.3 Political Support: Crucial for Long-Term Success

Determining the deposit and refund rate brings us to a very important point: the proposed system must be politically acceptable to government, business, and the public at large. Formal political support, from legislators and government, is essential as a new legal structure is being created, and it will be the government, assuming they control this particular legislative process, who must put the new law through due process. But if there is strong opposition from the business community then it becomes very hard to get politicians to act. The public may not generally participate in this preliminary debate if they have no direct experience of the results of the system, so getting members of the government - primarily Ministers - and leaders of the business community to support the proposal is a crucial element of success.

6.4 Public Acceptance: Thought-out Proposal and Hard Facts should be Ready

Businesspeople will want to see hard facts and figures, and reasonable cost estimates. They will usually be concerned in particular on two key points: how can they be sure that the deposits paid are returned to the public, and not siphoned off from the recycling fund; and how the system might impact their sales. It is important to realize that it is businesses that provide the deposit money 'up front' by paying deposits at the time of import or local production. This means they have added costs before they get to sell their product. This effect is most pronounced at the system start, for once they sell the product the deposit cost is built into the price, and they should get the money back.

More established businesses will be concerned that small and intermittent importers may be able to avoid paying the deposits, and so gain commercial advantage. One answer to this is that the system should be able to identify if smuggling is taking place, as if it is, deposits collected will be less than refunds paid out. Inspection of the cans and bottles being returned may well indicate some unusual brands that have not had deposits paid, so these systems can actually make it easier to catch smugglers. Usually it is beer that is smuggled to avoid excise taxes.

Business leaders in small island states are generally supportive of efforts to clean up their islands, and well presented and well thought-out proposals will generally find a receptive audience. For the public, they will be keen to get the refunds, but they will not be happy if prices increase. Again, key to this is getting the balance right of the refund being big enough to provide an incentive to return cans & bottles, but small enough to be lost in the normal price range of product prices.

Element 7

Establishing the Fund Management System

7.1. Protected Fund Specified to the CDS

The financial management of the fund is a critical part of the CDS. The legislation should set up the fund as a Special Fund of some type (unless an Managing Agency model is used) which will be determined by the existing financial law structures (see [Chapter 3](#)).

This structure ring-fences the deposits from any use that is not associated with refunds. This makes sure that the deposits are protected and only used for the particular purpose of refunds. This would not be the case if the deposits were placed in the government general revenue account and mixed up with other government revenue. The fund for the CDS in small island states will generally be operated by the Ministry of Finance, but even where a Managing Agency model is used, the same basic principles apply.

7.2. Refund Claims against the Fund

The System Operator will make weekly claims to the fund, based on the number of items collected and the refunds paid out to the public. A close eye needs to be kept to ensure that deposits are greater than refunds (except in the early stages when it can be expected there to be over 100% returns due to legacy waste) and that payments are verified against hard data. It is very important to be sure that the same items are not refunded twice. The System Operator should not normally be able to know how much money is in the recycling fund, to avoid the possibility that claims are made in excess of the actual amounts paid out if the System Operator knows that there are funds to cover the claim.

This requires a strong monitoring system, and regular reporting to the legislature is usually a requirement in any legislation setting up the CDS.

The count of redeemed items from a customer is entered into a receipt sheet, which is used to pay out the customer at the cashier desk. The duplicate receipt (carbon or non-carbon) becomes the record of the payment, and each payment is entered into a spreadsheet. Each day's payments are then entered into another worksheet of the file, and a weekly refund amount is calculated for refund claims.

Different items are noted on the receipt, so the numbers indicate how many aluminum cans, PET & glass bottles etc. were refunded. This claim is then passed to the administrator of the fund at the end of each week, and the claim checked and processed, so that by the end of the following week a payment should be made to the System Operator.

This way, the System Operator only needs sufficient cash capital on hand to cover about three weeks claims in order to operate. The claim to the fund per item is usually the entire deposit for each item, being the refund amount plus the Handling Fee component.

Certificate of Refund Claim from Recycling Agent (Island Paradise Co.) made weekly, Yap State, FSM

88-91-20-21

Certificate of Refund Claim Yap Recycling Program Account

Week Number 11 Year 2021
 Refund Claim Week Ending Friday 10/15/21

Cans and Bottles

Number of items refunded at 5 cents each 191602
 Refund Claim at 5 cents per refunded item \$54916.12

Total Claim from Recycling Fund \$54916.12

This Claim is provided to the Office of Administrative Services as the Administrator of the Recycling Program Account pursuant to the Yap State Recycling Act (Y.S.A. 7-18)

This Claim against the State Law, pursuant to Agent contracted by the State Recycling Program is made in accordance with Yap State Law, (pursuant to Agent contracted by the State Recycling Program) as a true representation of the data to Chapter 18, and pursuant Yap 3-2 (c).

By (print name) _____
 Signature _____ dated 10 day of October 2021

Office Use Only	Received
Date payment processed	
Check Number	
Officer	

Yap State Law 7-18 Supporting Information for Refund Claim to Recycling Collection Program Account

The following information extracted from the recycling system data includes the is supplied as supporting data for the refund claim against the Recycling Program Account for

Week 41 2021 of Friday 12th of October 2021

Collection	Received	Setoff	# Items	Refund \$	No. Cans/Bottles	Total Claim
Colon	\$4,008.10	\$4,303.10	9662	\$4,303.10	9030	\$3,496.10
Total	\$4,008.10	\$4,303.10	9662	\$4,303.10	9030	\$3,496.10

Additional supporting documentation is available for inspection by the Office of Administrative Services on request.

Verified a true record

Signature _____ Date 10-18-21

JESSE FAIMAW
dba ISLAND PARADISE METAL COMPANY
P.O. Box 76
ALUMINUM CANS

WK 41-2021

No.	CUSTOMERS NAME	Village/Municipality	Phone #	Quantity	DLR AMT	DATE REC'D	SIGNATURE
1				745	\$ 37.25	10/13/2021	
2				6,710	\$ 335.50	10/13/2021	
3				2,640	\$ 132.00	10/13/2021	
4				1,070	\$ 53.50	10/13/2021	
5				1,035	\$ 51.75	10/13/2021	
6				518	\$ 25.90	10/13/2021	
7				210	\$ 10.50	10/13/2021	
8				4,000	\$ 200.00	10/13/2021	
9				5,020	\$ 251.00	10/13/2021	
10				3,210	\$ 160.50	10/13/2021	
11				175	\$ 8.75	10/13/2021	
12				175	\$ 8.75	10/13/2021	
13				500	\$ 25.00	10/14/2021	
14				2,745	\$ 137.25	10/14/2021	
15				2,000	\$ 100.00	10/14/2021	
16				210	\$ 10.50	10/14/2021	
17				315	\$ 15.75	10/14/2021	
18				420	\$ 21.00	10/14/2021	
19				3,000	\$ 150.00	10/14/2021	
20				1,420	\$ 71.00	10/14/2021	
				36,118	\$ 1,805.90		

CERTIFICATION: _____ Date 10-18-21
 Jesse Faimaw for Designee

VERIFICATION: _____ Date _____

7.3. Un-redeemed Deposits

Unredeemed deposits - from items never returned, such as those thrown in the sea - remain in the recycling fund. These should slowly build up over time, and the legislation may allow these unredeemed funds to be used to invest in new recycling equipment. It is important to set up a system that does not allow unredeemed deposits to be siphoned off for non-CDS purposes.

If the System Operator is paid refund money before it is paid out to the public, then this can create an incentive to make it harder for the public to get their refunds. One instance has been found where the system operator collects all the deposits, and retains any money that is not paid out in refunds. This creates an incentive for the System Operator to make it difficult for people to bring in items to be refunded. Other constraints can be that people are required to register their names before they can bring cans in for refund, and the Collection Point is only open for two days every few months. This is an example of a 'perverse incentive', and something that can easily - but inadvertently - be created if care is not taken over the design of the system. Several systems set up many years ago in the Pacific failed for exactly these types of problems.

It is essential that the rules governing the fund operation do not allow these unredeemed deposits to be captured by one of the participants who take part in waste materials collection, as this can create a situation, noted above, that actually discourages recovery. This is one reason why, when using the Managing Agency model, that a target recovery rate must be mandated as otherwise there is an incentive for industry to lift selling prices but not spend money on refunds. Another essential point to watch with the Managing Agency model is that one large commercial player cannot game the system by getting the smaller ones to pay proportionally more deposit amounts; trust and cooperation between local commercial operators is essential if the Managing Agency model is to have any chance of success, for if government has to closely monitor and regulate the local industry for compliance, then it would be better to use the Special Fund model and let government run the financial side of the system.

Element 8

Absorbing Legacy Waste

8.1. Legacy Waste

When a CDS starts up, there are usually large numbers of cans and bottles lying around the place, and these may be collected up by people and bought in for refunds. This material is termed 'Legacy Waste.' The issue is that as deposits have not been paid on Legacy Waste, extra money is required in the funds to buy up this legacy waste. Is there any way to distinguish which items are Legacy Waste?

Some countries apply labeling of every product that refunds apply to. If the law says all products covered have to be marked with the refund amount, or else cannot be sold, importers and local producers in small countries may face difficulties buying products from overseas as the manufacturers do not change the labels. In small countries where virtually all goods are imported, it may be very hard to get overseas producers to print packages with the required notices for tiny Pacific markets.

The simple way is to allow refunds of all target items presented, as long as they are whole and clean. These two parameters should be included in any Regulation; they will ensure that if old dumpsites are dug up for cans then the people who dig them up will have to do a lot of work to make the items presentable for refund. Also, dirty cans and bottles can easily result in a shipment being rejected overseas by the recycling processor as unfit for processing, or impounded by quarantine authorities as dirty. The requirement that cans and bottles presented for refund must be whole and clean helps to decrease the amount of legacy waste presented for refund.

8.2. Estimations of, and Provisions for, Legacy Waste

Despite countermeasures to reject the legacy waste brought in for redemption, most of it will be collected. How to find the money to pay the refunds for legacy wastes is the immediate difficulty as no deposit has been paid on these items. The two simplest methods for this are: starting collecting deposits some time before paying out refunds (e.g. 6 months in Palau's case and Tuvalu's case), so as to build up the recycling fund, or obtaining sufficient one-time funding to carry the system through the early months.

See [RMI Case Study](#)

In the Marshall Islands, the Government allocated seed money to pay for legacy waste, which bought up 1.66 million legacy cans and bottles.

Either of these methods require making some determination of how much legacy waste might be lying around, and making an estimate about how much of it might come in for refund. For example, in Majuro in the Marshall Islands, where about 35,000 people consume around 14 million cans & bottles per year, the legacy waste that came in over the first year was estimated at around 2.5 million items.

Element 9

Data Reporting and Implementation Monitoring

9.1 Regulatory Agency

The governing legislation usually requires that the Regulatory Agency make an annual report to the national parliament. This ensures that at least once a year, the regulator conducts a review of the CDS, and the various main participants - Customs, recycling fund manager, and System Operator - all put their data into a single report. This allows an overview of the effectiveness of the system, and whether it is working well to recover the waste cans & bottles. If it is found that the recovery rate is dropping significantly, then this may well be an indication that the refund is too low to provide enough incentive for the public to bring their cans and bottles back. Also, if there is a deficit between the deposits paid and the refunds paid out, this may indicate that smuggling or other non-compliance is taking place. However, it should be noted that at the start-up of a CDS, deposits will usually be less than refunds for a while until the legacy waste is cleared.

9.2 Customs

Customs import data is of course essential to see what is coming into the country. Where a 'Special Fund' model is used for CDS, and the Customs Service is collecting deposits, then the import data is directly tied to the deposits paid. If the import / deposit data is collected to identify the type of beverage container, this will allow precise recycling rates to be determined for different materials, such as aluminum, glass and PET.

Where a Managing Agency model is used, Customs data is still very important to track imports and deposits, but also will show the percentage of drinks imported compared to the overall total consumed.

9.3 Collection Points/ Redemption Center

The Collection Point data is what is used to make claims for refunds by the System Operator. This data must be precise and verifiable in order to ensure that refunds are only paid out on items returned. This is dependent on the counting system, and shows why the counting system must be accurate. For example, if weight is used to count items, and they are bulked up with sand, then refunds will be greater than the actual number returned. This can quickly crash the entire system as there will not be enough money from deposits to pay refunds. It is important to separate out the refund numbers for different types of materials so that these refund numbers can be checked against the quantities baled.

9.4 Checking blocks and bales against refunds

After baling and pressing of materials, then the bales can be counted, and using an average number of items per bale, a check on the numbers baled and the numbers refunded can be made. Similarly,

when a container full of recyclable materials is shipped to an overseas buyer, the materials inside are weighed. This weight can provide another check on the numbers refunded. For example, a typical weight for aluminum cans is around 68,000 per tonne (this can vary depending on the main source of cans). So the weight of aluminum sold can be a general check on the number refunded.

PET plastic bottles are a variety of sizes, and a general figure to use is around 32,000 per tonne, but this can be checked locally given the mix in the particular country. These checking numbers will not provide exact comparison numbers, but they do provide a close enough check to see that the system is working correctly.

Example of Data Analysis

Source of Data	Results	Concept
<ul style="list-style-type: none"> Collection Points Customs (data by material type is ideal) 	⇒ Redemption rate/ Recovery rate	This is the percentage of all beverage containers returned for refund compared to the total number paying deposits
<ul style="list-style-type: none"> MRFs Customs (data by material type is ideal) 	⇒ Recycling rate	This is the percentage of all beverage containers recycled compared to the total number paying deposits

Chapter 3

Lessons Learnt

Case 1 *The Marshall Islands - Project for Introducing and Operating a Container Deposit Scheme*

Case 2 *Republic of Kiribati*

Case 3 *Kosrae State, Federated States of Micronesia*

Case 4 *Yap State, Federated States of Micronesia*

Case 5 *Republic of Palau*

Case 6 *Tuvalu*



Copyright: Mr. Kanazawa Masafumi, JICA Volunteer MAWC

Case 1

The Marshall Islands

Population: 58,791 (WB, 2019)



Project for Introducing and Operating a Container Deposit Scheme



The beverage container deposit scheme in the RMI covers PET and glass bottles, and aluminum cans. The RMI passed the amended law and regulations in 2018, after initial legislation in 2016, and this allowed the system to start in August 2018 in Majuro Atoll. By the end of 2019, the system had recovered around 20 million cans and bottles, with a split of roughly 59% aluminum cans, 40% PET, and 1% glass bottles. In July 2021 operation was extended to Kwajalein Atoll (Ebeye), the second largest island of the country.

In this chapter, by virtually visiting where the CDS is operational, you may deepen your understanding about the steps for introducing CDS in the country, and some crucial factors to be considered.

Geography, Industry and Logistics

The RMI has two international shipping ports, one on Majuro and one at Ebeye. Both can handle shipping containers, but at Ebeye containers cannot be moved off the wharf container park as there is no side-lifter truck(*) on island. In Majuro, the wharf has a 20 tonne weight limit that means aluminum cans can only be exported in 20 ft containers.

All beverages are imported, except for one small local bottler of water, Pacific Pure Water, which mostly fills larger one gallon and five gallon jugs for drinking water, and these large jugs are refillable and not included in the deposit system. A high proportion of drinks come in aluminum cans, which is good for the system as these have an export resale value, whilst very little beer comes in glass, with glass beverage bottles being only 1% of the total recovered, and these include wine and spirit bottles.



SYSTEM RESULTS

Table 7 RMI Redemption Result 2019

	Number of Items		Redemption Rate (%) *1	Recycling Rate (%)
	(/y)	(/y/person) *2		
Aluminum cans	Refunded	9,205,723	156.58	N/A
	Deposited	N/A	-	100%
PET bottles	Refunded	6,366,856	108.30	N/A
	Deposited	N/A	-	N/A
Glass bottles	Refunded	141,916	2.41	N/A
	Deposited	N/A	-	N/A
Total	Refunded	15,714,495	267.29	109%
	Deposited	14,354,295	-	N/A

Source: Annual Report to the Nitijela on the Container Deposit Legislation Recycling System, RMI EPA, 2019

(*1) The data was calculated by the formula: $100 \times (\text{no. of items refunded} / \text{no. of items deposited})$

(*2) The data was calculated from the number of redeemed items in the report and the population in 2019.

Q: Why is Redemption Rate per material type NOT identified?

A: The number of items that deposits are paid is available but it is not available by each material type. The deposit is paid into the Recycling Fund by Customs officers in the usual manner of import taxes, but whilst the deposits are separated out, so that a record of the deposits paid is kept, but this is not broken down by beverage container material type.

Q: How is the Recycling Rate identified in RMI?

A: Only aluminum cans are exported at this time (2021) as a market for PET is not available given the shipping costs and comparatively small quantities. Glass is crushed and reused in the landfill for internal roading.

Table 8 Income and Expenditure of CDS System Operator (MAWC) 2019

Income	<p>Handling fee \$157,144.95USD/year *15,714,495 redeemed items×\$0.01 handling fee</p> <p>Sales for recycling Sale of aluminum cans: \$119,680 USD/y *MAWC sold 9,205,723 aluminum cans (=136 tonnes) for around 880 USD/tonne in 2019. *136 tonnes being about seven and a half full container loads (20 ft units) were exported and sold to South Korea</p>
Expenditure	<p>MAWC paid for: Refund payments Labor costs: five workers in the recycling shed Electricity to operate the bailing press</p>

	Freight costs to move and export shipping containers of aluminum cans Some other administration costs.
--	---

(Source: J-PRISM Joint Coordinating Committee for the Micronesian Countries 2020)

DEPOSIT SCHEME OVERVIEW

1. Legal Framework

The Act was passed in 2016, but amended in early 2018 to make implementation more practical. Regulations were promulgated in May 2018.

- Styrofoam Cups and Plates, and Plastic Products Prohibition and Container Deposit Act 2016, Amended 2018.
- Recycling Program Regulations
- Contract between the Environmental Protection Authority and the Majuro Atoll Waste Company for System Operator on Majuro
- Contract between the Environmental Protection Authority and Kwajalein Atoll Local Government for System Operator on Ebeye

2. Fund

Recycling Special Revenue Fund

3. Agencies

Table 9 Agencies Involved for RMI CDS

Agencies	Roles
Republic of the Marshall Islands Environmental Protection Authority (EPA) (The 'Recycling Agent')	Regulatory agency of the programme. They are the 'Recycling Agent' specified in the legislation in charge of administration of the system. Development, promulgation and amendment of the legislation/ regulations is their duty. EPA regulate the 'System Operator' in line with the legislation and contract.
The Ministry of Finance (MoF)	Pays out refund claims from the 'Recycling Special Revenue Fund' to the System Operator, and operates the Fund.
Customs Office of the MoF	Collects deposits at the port of entry and sends them to the 'Recycling Special Revenue Fund'
The 'System Operator'	
Majuro Atoll Waste Company (MAWC) *The government-owned enterprise	MAWC is the 'System Operator' which actually operates the system in Majuro Atoll under the contract with EPA.
Kwajalein Atoll Local Government (KALGOV)	The 'System Operator' which actually operate the system in Ebeye Island under the contract with EPA.

Importers	Pay the deposits on the target items that they produced/ imported. Importers provide the required information to the Customs.
Consumers	Recover the target items and take to the collection points in a designated manner (that is, 'clean and whole').

4. Deposit/ Refund/ Handling Fee

Table 10 Deposits, Refunds, Handling Fee (RMI)

No.	Target Items	Deposit (USD/container)	Refund (USD/container)	Handling Fee (USD/container)
1	Aluminum cans	\$0.06	\$0.05	\$0.01
2	PET plastic bottles	\$0.06	\$0.05	\$0.01
3	Glass bottles	\$0.06	\$0.05	\$0.01

Conditions

Only covers ready to drink beverages in containers of 32 oz.(946ml) and lower in aluminum cans, PET plastic bottles, and glass bottles.

Excluded: Dairy products as it would retain contaminating substances, a tetrapack and other odd beverage container types as these numbers are very low.

Information Sheet for Business

New Recycling System for the RMI

The Nitijela has passed a law to encourage recycling of cans & bottles in the Marshall Islands'. This law puts in place a deposit payment system for drink cans, glass and plastic bottles, so that these items can collect a refund of 5¢ on return to the recycling system. These types of recycling systems are common around the world, as well as in our Pacific neighbours of Kiribati, FSM, Palau and Hawaii. These systems dramatically reduce the litter of cans & bottles, as well as directing these materials away from landfill.

The system works as follows:

- 6¢ will be paid at import for every aluminium can, glass or PET plastic (#.1) bottle that contains a drink. PET bottles are usually marked like this:
- The money will be collected by the RMI Customs at import into the RMI, in the same manner as import taxes and the CMI 'Sin Tax'.
- This money is NOT A TAX. It is a deposit on the cans and bottles to finance the refund, which makes the recycle system work. No money goes into the General Revenue fund.
- The money collected at customs is deposited into the Recycling Special Revenue Fund set up at the Ministry of Finance under the recycling law.
- The money in the Recycling Fund is only available for refunding the items which have had a deposit paid. The Recycling Fund is thus a Revolving Fund.
- The Importer has now paid 6¢ deposit per item, and the 6¢ extra becomes part of the cost of the drink, so this must be factored into retail prices.
- After consuming the drink, the public can take the can or bottle to the MAWC Recycle Collection Point, and receive \$1 for 20 cans & bottles - which is 5¢ each. The minimum number is set at 20 to allow cash payment of refunds and monitoring to be much simpler.
- MAWC claims back the full 6¢ deposit for every 5¢ item refunded, from the Recycling Fund.
- MAWC keeps the 1¢ per item as their Handling Fee to help finance the recycling operations.
- MAWC crushes the material and exports it for recycling, or for local use, e.g. crushed glass in concrete.

The system will cost the consumer 1¢ if they return their own cans and bottles, or 6¢ if someone else returns them. The deposit must be factored in to the setting of prices, it is not expected that the importers should bear this cost. Importers will have to find the money to pay the extra 6¢ each at import (\$1.44 on a case of 24). However, this should all be passed on to the consumer as the cost of the drink has risen, just as if shipping or wholesale costs had risen.

Exemptions: A list of products that are exempt due to their package type is being created, and this will be at Customs for easy reference. Drinks that are exempt are those in cardboard cartons, non-PET plastic bottles (not many), plastic pouches, steel cans, and any drink container that is greater than 32 fl.oz. or 950ml. Also, milk products are exempt, but not those with only trace amounts of milk. Drink powders or concentrates are exempt. The law is targeted at those drinks that may be consumed casually, direct from their can or bottle, outside the home, and that may well end up as litter.

How to pay the deposit at Customs?
Currently, most soft drinks and beer pay a 'sin tax' that is collected and diverted to fund CMI. The same system will be used to collect the recycling deposit, which is diverted to the Recycling Special Revenue Fund. This should require very little change in the way the system works. Importers should be aware of any products that are exempt, and the excel sheet provided identifies many of these. Importers will calculate the amount due on their import entry sheets, but pay a single amount as usual, and Customs will divert the deposit money collected to the Recycling Special Revenue Fund. The importer does not need to pay the deposit amount separately.

How are cans and bottles counted?
Can & Bottles will be counted with volume measures at MAWC. This way, there is no incentive to add sand to cans to increase their weight, and so value, if they are weighed. It also makes counting quick and simple and easy for the public to see. Cans and bottles should be uncrushed, and MUST BE CLEAN. If crushed cans and bottles are provided, they will be hand-counted, but this is discouraged - except for Outer Island people bringing in cans & bottles who have had to ship them in.

Why must cans & bottles be clean?
Dirt in the crushed cans will cause significant problems with overseas buyers both for quarantine issues and value of materials. Thus the cans must be clean.

Will everything collected be exported?
Right now, cans will be crushed and exported. PET plastic was going to China until the beginning of 2018, but China has now stopped imports of PET bottles, so these may be baled for local use, probably as landfill. Glass will be crushed for local use as it has no value to export. This can be used for internal roading in the dumpsites to cut down muddy areas, or in concrete as aggregate, especially for non-structural applications. The Handling Fee evens out the overall costs and incomes so that the system is self-funding, as income comes from cans exported.

For More Information

If you require more information regarding these changes, please contact Kristina Reimers at EPA:

RMI Environmental Protection Authority
P.O Box 1322
Majuro, Marshall Islands
96960
Telephone: 625 3035/5203

(Source: EPA, The Marshall Islands)

5. End of Use Product Management

Aluminum cans are baled in a large scrap metal press, and packed into shipping containers for export. These have been typically sold for around \$950 per tonne to an Australian company who sends them for smelting down into new aluminum products. The baling press gets around 18 tonnes into a 20ft container. PET bottles are also baled in the same press, but there is no market for these (2021), and container density would probably be of the order of 8 - 10 tonnes per 20ft container. Some bales of PET have been used for local 'clean' fill in situations where it can displace sand mining, and where no building will go on the resulting land, but these bales must be buried in sand to pack them down, and not be too near sea walls. EPA has developed a protocol to cover using PET bales in this way. Glass bottles are broken by hand, or by driving an excavator over them, and can be used for filling boggy sections of internal road in the landfill, as the amount of glass when crushed is very small.



Baled PET bottles for filling landfill, RMI (Copyright: Mr. Kanazawa Masafumi, JICA Volunteer)

STEPS TO CDS INTRODUCTION in RMI

2016

EPA Submitted a cabinet paper suggesting a feasibility study.

P.L. 2016-17 Styrofoam Cups and Plates and Plastic Products Prohibition and Container Deposit Act 2016 passed. Implementation problems are found in the legislation.

Technical Assistance from J-PRISM II (2017-2022) is endorsed.

2017

- Conduct a Preliminary Survey:
 - To identify and analyze stakeholders through bilateral meetings with relevant public/ private entities;
 - To assess potential amendments of relevant legal documents;
 - To estimate amount of target materials through custom import data analysis;
 - Design a potential operational model;
 - Consult on public opinion and perceptions of the legislative amendment and implementation planning;
- Project planning and identifying project



Study on the target beverage products at the local stores.

implementation steps;

- Drafting amendments of the Act.

2018

- **(January)** Approval of the Act amendment by the Nitijela (Senate);
- Drafting the regulation;
- Approval of the regulations by the Cabinet;
- **(May)** Promulgation of the regulation;
- Drafting the **contract to appoint Majuro Atoll Waste Company as a System Operator** who runs an MRF in Majuro where the redemption, segregation and bailing take place;
- 6Consensus building, consultation, and trainings for;
 - Custom Office on **how to collect deposit;**
 - Chamber of Commerce on the overall system and how it works;
 - MAWC as a System Operator on **how to calculate the collected items, accounting, claiming to Ministry of Finance;**
- **(July)** Starting deposits collection at the port of entry;
- Concluding the contract between MWAC and EPA;
- **(August) Official launching of the system with a commencement of the operation including collection of and paying out for all the target items.**



Discussions on the system design between EPA, MAWC, and Customs.



Official launching ceremony with the President Hilda Heine (Copyright: Mr.

2019-2020

- Monitoring and assessment of the system.

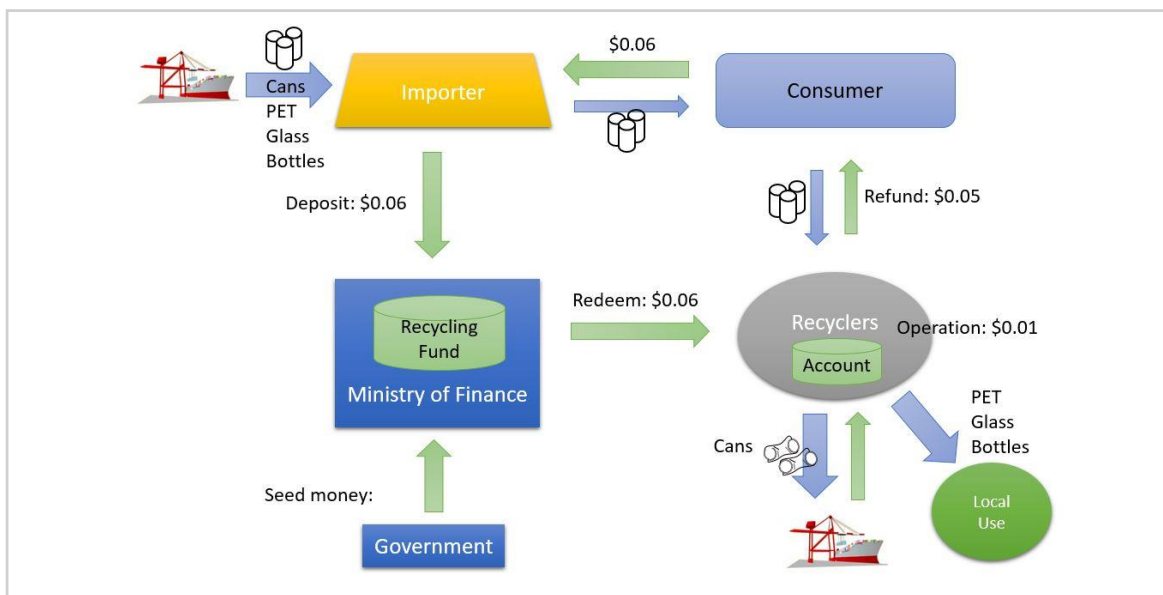
2021

- **(June)** Commencement of the redemption in Ebeye with two can balers.



Baler in Ebeye, KALGOV

FLOW of MONEY



(Source: J-PRISM II)

Deposit Payment, Point of Levy

Deposits are paid to the Customs Officers at import clearance. Importers of beverages have been provided with a list of products to assist them to identify what needs to pay a deposit. There is one local producer of beverages, a local water bottler, and they pay the Ministry of Finance monthly based on sales from their bottling plant. There are no requirements for registration by importers, but cargo cannot be cleared off the wharf until the deposit is paid to Customs. Deposits are held in the Recycling Special Revenue Fund which is managed by the Ministry of Finance.

Refund Payment, Point of Redemption

People bring their cans & bottles to the Majuro Atoll Waste Company (MAWC) Recycling Centre at Batkan on Majuro Atoll. As of 2020 there was only one recycling collection point, and another opened in 2021 on Ebeye Island in Kwajalein Atoll operated by the Kwajalein Atoll Local Government, based at the Ebeye dumpsite. Cans & bottles are counted using standard wire cage baskets, with one basket full being 500 cans, or 300 PET bottles. These are average numbers, but the public accepts this, and it makes counting much quicker and more accurate. Aluminum cans can be bought in on Mondays and Tuesdays, and PET and glass on Wednesdays and Thursdays to Batkan. Glass bottles are only 1% of the total, and these are hand counted. After counting, the customer is given a numbered receipt for their items, which they take to the cashier window and receive cash. Some very large amounts, such as from bars, will be paid by check. A minimum number of items is specified at 20 (\$1 refund), so all payments are in round dollars.



Redemption cahier at MAWC (Copyright: Mr. Kanazawa Masafumi, JICA Volunteer)



Receipt issued from MAWC (Copyright: Mr. Kanazawa Masafumi, JICA Volunteer)

Fund Management

The Ministry of Finance is the Recycling Special Revenue Fund manager; this fund is separate to the government General Fund and ring-fenced as it is classed as a Special Revenue Fund. Money is paid into the Fund by Customs officers in the usual manner of import taxes, but the deposits are separated out, so that a record of the deposits paid is kept, but this is not broken down by material type. A designated Ministry accountant receives a Refund Claim every week from the recycling System Operator (MAWC) and this is for the previous week's payments of refunds. The Claim is made using a standard form Certificate which details information about how much was collected each week, and each certificate is numbered. Each receipt for each customer is numbered, and entered into an excel file. The data on cans & bottles crushed is entered into the excel file, and this provides supporting information for monitoring purposes.

Lessons Learnt 1: Legacy Waste

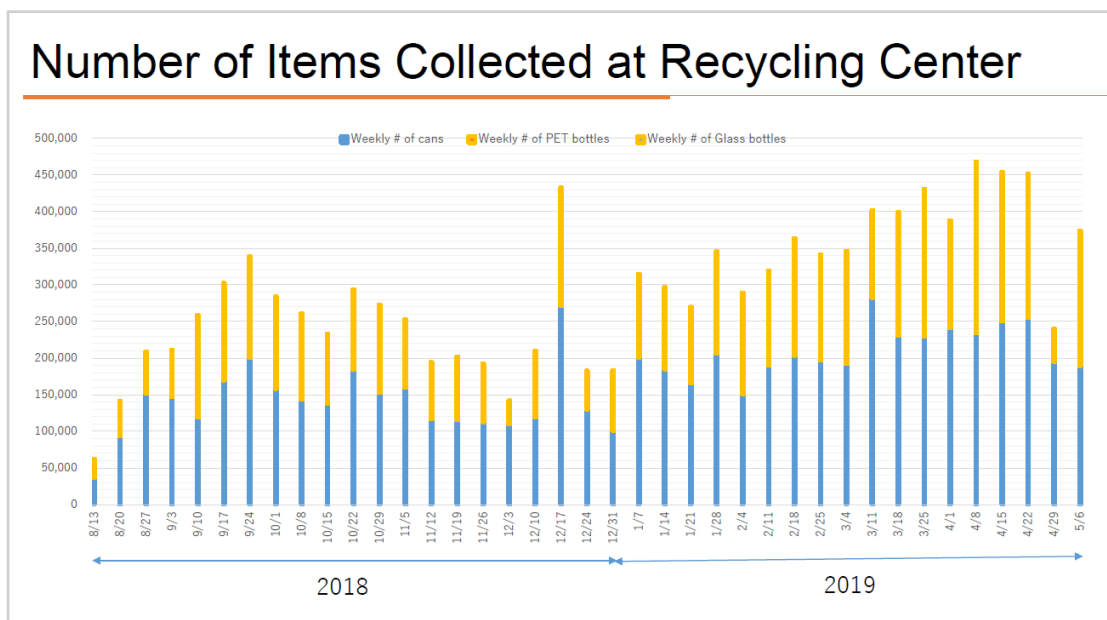
One of the biggest challenges for the Marshallese system was dealing with the 'legacy waste'. This is the cans & bottles that are refundable, but were already on-island before the system started, and so did not pay a deposit. It is not realistically possible to determine exactly when cans and bottles were imported. It is very hard at the start to know how many items might come back that didn't pay a deposit, and these items need to be refunded by extra 'seed money'.

How much 'seed money' is required, and who will fund it, was an important issue to discuss at the initial stage. An estimation was made as to how much money might be needed, based on estimated annual consumption, where that consumption takes place, and how much can & bottle litter is around. It was found that MAWC had previously bought aluminum cans for 30¢ per pound (approx. 60¢ per kg), which meant that a can was worth around 1¢ each at that price (Formula: 1kg = 68 units of 350 ml aluminum cans - approximately, depends on manufacture source of cans). This helped project that a 5¢ refund would be enough incentive to the public to return their cans.

A 6¢ deposit was then determined based on the 5¢ refund to the public plus a 1¢ handling fee to the system operator. For legacy waste, an estimation was made that if \$100,000 were available as a capital

investment (seed money), then this would buy up 1.66 million cans & bottles at 6¢ of each, comprised of 5¢ to the public and 1¢ to the system operator per item refunded.

After a presentation to Cabinet, the government decided to allocate a recent fishing boat fine of \$100,000 as the seed money for the system, but was also aware that more money might be required. In the end, it appears that by the end of 2019, the actual number of legacy items refunded was around 2.5 million. The seed money bought 1.66 million, but if the recovery rate was 85% - as indications are from rates at the end of 2019 - that additional 15% of deposits (called 'un-redeemed deposits') went to fund these additional legacy items. The Recycling Fund actually got very short of money in early to mid 2019 after 8-10 months redemptions from August 2018, which indicates that legacy waste was significantly in excess of the 1.6 million funded, and that the un-redeemed deposits were funding the rest. However, by the end of 2019 the Fund was looking healthier and had settled down to a consistent level.



(Source: MAWC, RMI)

The issue of legacy waste at system start up is a serious cash-flow issue that must be carefully considered in any system design at the implementation phase, and ideally, a credit facility should be available to support the Recycling Fund through this period, as required, until refunds fall below deposits and a true recovery rate (which by definition will be below 100%) can be seen. This process can take a year or more, especially when significant numbers can come from outer islands, for example from Ebeye, where it took some months for cans to start flowing in quantity to Majuro.

Lessons Learnt 2: Development of Legal Framework

The Nitijela passed the recycling legislation in 2016 as part of an Act that also banned Styrofoam cups and plates, and the Bill to ban Styrofoam had already been drafted when the Minister in Assistance to the President was given a Cabinet Paper on the development of CDL for the RMI. However, whilst the

Cabinet Paper called for a Feasibility Study to design the system and decide such things as deposit and refund rates, the Minister directed the EPA to go ahead and draw up legislation before doing any feasibility study, as he thought the entire concept a good idea. The resulting legislation was based largely on a US-style 'Bottle Bill' template, which style of legislation is used at State level in the USA. As a result, the legislation required significant amendment before it could be implemented in the RMI, as trying to implement it in its 2016 form was very likely to lead to failure for a number of reasons. For example, EPA was mandated to collect the deposits 'at the time of first retail sale'. In practical terms, this would require EPA staff to set up a system to collect money from individual stores selling drinks. The fund into which deposits were to be placed was unclear; the level of refund and method by which refunds would be paid out to the public was also unclear. These issues were identified and analyzed by J-PRISM Technical Assistance during 2017, and an Amended Act was passed in 2018 which made it possible to go ahead and implement the recycling system during that year. The Amended Act pushed many of the system details into a Recycling Program Regulation, which came into force in July 2018, and which specified which types of material used in beverage containers were covered; it also gave the EPA the power to sub-contract out the practical functions of 'Recycling Agent' to a business operation, known as the 'System Operator'.

The conventional approach would be to create an Act that provides for the general principals of Product Stewardship and the means to recover waste materials through deposits and refunds. Such an Act would include powers to regulate to further the aims of the Act; in any pursuant Regulations under that Act, the details of what materials are covered, and how they are to be dealt with, are then laid out. This is the pathway followed in the neighboring countries of Kosrae and Kiribati. The key point to take away here is that the system should be developed, and many details worked out, before legislation is finalized. This approach ensures that the legislation fits the system design, not the other way around, so that the system has to be designed to suit legislation previously passed. The latter approach resulted in significant delays to implementation of the system in the RMI.

Lessons Learnt 3: Public Awareness

The effort to inform the public was quite small and simple in the case of the RMI. In fact, it was useful to avoid much advance publicity prior to the system starting, as this would encourage people to start stockpiling old cans and bottles, and so add to the legacy waste problem and the finance required to buy up this non-deposit waste. Once the system was set up and ready to roll, and the regulation had been gazetted and was in effect, the EPA public information unit then took out some advertising in the local newspaper, the Marshall Islands Journal, and had some adverts on the local radio. But the most important source of information was word-of-mouth: when the recycling system actually opened for buying cans & bottles at 5¢ each, the immediate expected rush didn't happen, but after two weeks it really took off. Once people saw that they really were going to get 5¢ each for cans & bottles, the word went around Majuro very fast, and no more publicity was needed. It is notable that in places such as Fiji and Vanuatu, where local beer bottles have a refund value for re-filling, no markings or advertising of the fact is required, but everyone who needs to know surely does. Some people- such as tourists - do not need to know about the refunds as they are unlikely to turn up at the recycling

center with their cans, and anyway, the minimum refund number is twenty units (\$1). Word of mouth in a small place is the most effective advertising, and it is cheap. The most useful formal advertising is around what items are covered, and that items must be reasonably clean and whole to get a refund. These are the key messages that any public engagement campaign must put out.

Reference:

- Annual Report to the Nitijela on the Container Deposit Legislation Recycling System, RMI EPA, 2019
- A Preliminary Survey on Container Deposit Legislation for the Republic of the Marshall Islands, J-PRISM II, August 2017

(Author: Mr. Alice Leney, J-PRISM II; Editor: Ms. Mayu Nomura, J-PRISM II)

Case 2

Republic of Kiribati

Population: 117,608 (WB, 2019)



Background/ History of the Deposit Scheme

The Kiribati recycling system – called the *Kaoki Maange*, which means ‘Return the Rubbish’ – was developed from 2002 to 2005 by the NGO Foundation for the Peoples of the South Pacific Kiribati (FSPK) working alongside the Environment and Conservation Division of the Ministry of Environment, and the Ministry of Commerce. FSPK raised funding for an initial system design report, which then led into the development of a recycling yard provided by the government at the Betio Port, and some equipment provided by a variety of donor small grants. In 2004 the United Nations Development Programme partnered the project, and funded it through to completion in 2005, when it was fully operational and tendered out to a local business. The system made a huge and very visible impact on can & bottle litter on South Tarawa, the capital, and created informal jobs for many low-income people who collected up cans & bottles. Whilst all Collection Points were on South Tarawa, nearly all consumption was located there too, and in the early years very high recovery rates of well over 90% were recorded. The system also includes lead-acid batteries. The initial System Operator, who had contracted operations all through project development, failed after a few months, and a second operator then took over, who has remained until the time of writing (2021). The words ‘Kaoki Maange’ are now synonymous with recycling in the Kiribati language. In 2010 the system handled 3.5 million aluminum cans, 600,000 PET bottles, and 2,200 lead-acid batteries. Data below is based on three months Aug/Sept/Oct 2020, extrapolated for 1 year. In 2006 analysis indicated recovery rate of around 90%, but this looks to be lower today.

Table 11 Kiribati Redemption Result 2020

	Number of Items			Redemption Rate (%) ^{*1}	Recycling Rate (%)
		(/y) ^{*2}	(/y/person) ^{*3}		
Aluminum cans	Refunded	3,400,000	29.05	N/A	N/A
	Deposited	N/A	-		
PET bottles	Refunded	970,000	8.29	N/A	N/A
	Deposited	N/A	-		
Lead-acid batteries	Refunded	2,500	0.021	N/A	N/A
	Deposited	N/A	-		

Source: Kaoki Maange Recycling Operation Environmental Report, November 2020, Environment & Conservation Division, Kiribati

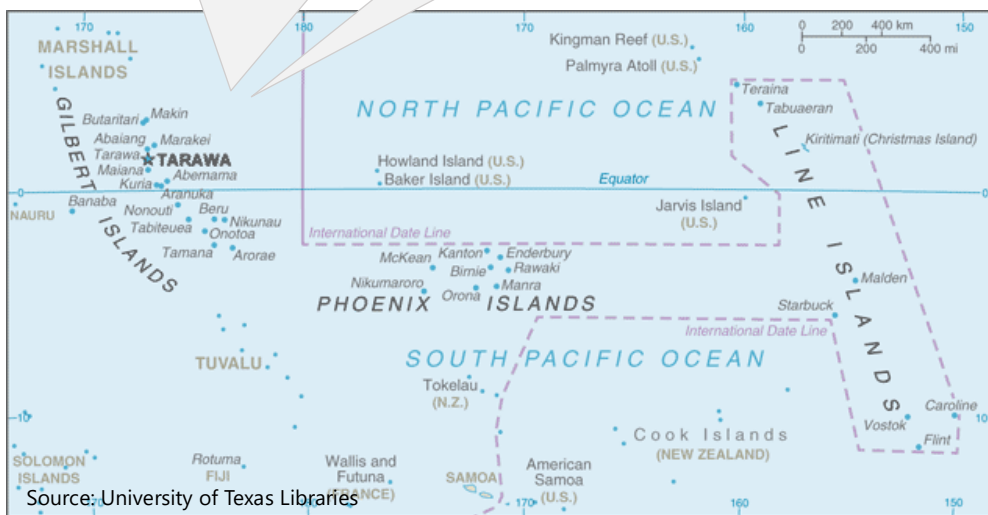
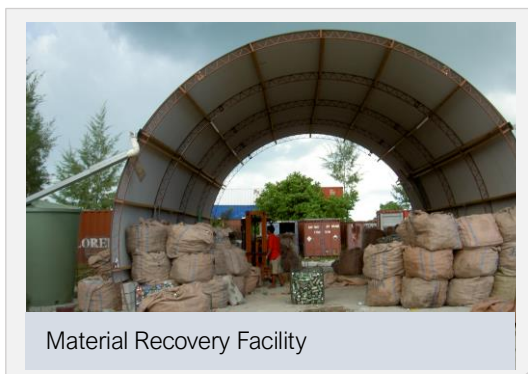
(*1) The data was calculated by the formula: $100 \times (\text{no. of items refunded} / \text{no. of items deposited})$

(*2) The data extrapolated based on three months data of Aug., Sep., and Oct. 2020.

(*3) The data was calculated from the number of redeemed materials in 2020 and the population 2019.

Geography, Industry and Logistics

Kiribati has three island groups, all atolls, spread over an area of ocean the size of western Europe. Most people live in the Gilbert Islands group, due north of Fiji and around the Equator. A second group south of Hawaii has perhaps 20,000 people on three atolls, and the third group, the Phoenix Islands, has only one inhabited island - Kanton - with a single government station on it. Half of all the population lives on South Tarawa, the southern half of Tarawa atoll, and the capital of the nation. nearly all consumption of packaged beverages takes place here. There is an international sea port at Betio in South Tarawa, and the recycling Materials Recovery Facility (MRF) is situated immediately next to the port fence, making movement of full containers for export very easy. There are no local bottlers of drinks, apart from some artisanal bottlers who refill used empty PET bottles. There are five collection points spread across South Tarawa, and the system did operate in Kiritimati Island for a couple of years around 2012, but has since failed for indeterminate reasons.



Overview

1. Legal Framework

The Act was passed in late 2004, and the Regulations came into effect in February 2005. The Act and Regulations have not been changed since.

- Special Fund (Waste Materials Recovery) Act 2004
- Special Fund (Waste Materials Recovery) Regulations 2004

- Special Fund (Waste Materials Recovery) Act Deposits Order under 4. (1)
- Contract between Ministry of Environment and the System Operator

2. Fund

The Special Fund (Waste Material Recovery)

3. Agencies

Table 12 Agencies Involved for Kiribati CDS

Agencies	Roles
The Environment and Conservation Division of the Ministry of Environment, Lands and Agricultural Development	Regulatory agency of the programme. Monitor and regulate the 'System Operator' and the entire recycling system. Development, promulgation and amendment of the legislation & regulations.
The Ministry of Finance	Collect deposits from producers(importers), and send them to 'The Special Fund.' Pay out refund claims from the fund to the System Operator, and operate the Fund.
Kiribati Recycling (The 'System Operator') (Kiribati Recycling is the current contracted System Operator and is effectively part of a business called One Stop, which is a wholesaler and retailer of groceries and beers, wines and spirits, one of the largest importers of beer into Kiribati.)	They are the 'System Operator' which actually operate the system in the state under the contract with the regulatory agency. The conditions are specified in the contract. e.g. operate several Collection Points and the single MRF, make refund payment to consumers, handle materials, counting items and transfer them to the single MRF, process items (crushing/ bailing), and export overseas for recycling.
Producers (importers)	Pay the deposits on the target items that they imported in accordance with the HS number in the national Customs Tariff. Importers provide the required information to the Customs.
Consumers	Recover the target items to the 'Collection Point(s)' in a designated manner to collect their refunds.
The Ministry of Commerce	They were involved in the early system development as they saw the potential to make a number of jobs, which did happen.

4. Deposit Rate/ Refund Rate/ Handling Fee

No.	Target Items	Deposit (USD/unit)	Refund (USD/unit)	Handling Fee (USD/unit)
1	Aluminum can	\$0.05	\$0.04	\$0.01
2	PET bottle	\$0.05	\$0.04	\$0.01
3	PET preforms (for making PET bottles)	\$0.05	N/A (*1)	N/A
4	Lead-acid battery	\$5	\$5	None
Conditions				
PET bottles include cooking oil bottles made of PET. Minimum number for redemption is 5 units (20¢ refund). (*1) PET preforms is target item under the regulation while there are no local bottlers. There are only some artisanal bottlers who refill used empty PET bottle on which the deposit has been levied already.				

5. Flow/ Management of Money and Goods

<<Deposit Payment (Point of Levy)>>

Deposits are collected by Customs at time of import entry, and deposits must be paid before cargo is cleared. Electronic Customs entry forms have a Container Deposit field that goes 'live' if relevant HS tariff numbers are entered for something liable to pay. This system was put in place during the project design phase by working with Customs Technical Assistance at that time in 2005 and makes identification of target items very easy. Importers are also provided with a sheet that lists target items by typical product names. Also, vehicles are levied for battery payments as each vehicle imported comes with a battery. There is no local bottling at this time. There is no licensing requirement for importers.

<<Refund Payment (Point of item collection and redemption)>>

Refunds are paid in cash at the Collection Points. There is a main Collection Point at the Materials Recovery Facility (MRF) at the Port of Betio at one end of the atoll road system, and this is open five days per week 9am - 5pm. Remote Collection Points are at four other locations along South Tarawa at Bairiki, where the main government offices are; Teoraereke, a large village half way along South Tarawa; Bikenibeu near the main hospital; and Bonriki at the airport, the other end of the road from Betio. These remote Collection Points use old shipping containers that are painted up with *Kaoki Maange* on the side. The remote Collection Points are open one day per week for a few hours and make it easy for people to bring their cans & bottles and batteries for refund, as many people on South Tarawa do not have access to vehicles, and many of the collectors are low-income people. The System Operator's truck collects the cans & bottles, and a cashier spends a few hours at the Collection Point to buy items. Paid-for items that are not taken away in the truck are left locked-up in the container until the next visit. Cash is paid at the time of redemption.

<<Fund Management>>

The Ministry of Finance operates the Special Fund (Waste Materials Recovery). As the Kiribati Customs Service is under the Ministry of Finance, deposit payments are directed straight into the Special Fund. Refund Claims are made on a weekly basis using a special numbered Claim Certificate, must be processed within five days, and this time limit is rarely exceeded. The Chief Accountant is in charge of processing these claims, with the routine work done by a member of the Ministry's accounts staff. Payments are made direct to the System Operator's bank account after verification. When the Kiritimati Island recycling system was operating, where the Kiritimati Island Council was the System Operator, Claims would also be made through the Tarawa System Operator.

6. The End of Use Management

Cans & bottles are collected and counted using wire baskets. Kiribati was the first place to use this system, developed to speed up counting and also make it more accurate over time. Aluminum cans are crushed in a baling press that takes 500 cans per crush and puts 14 to 15 tons into a 20 ft shipping container for export. PET bottles are also crushed in this press, and used to be exported to China, but with the collapse of that market after the 2018 restrictions put in place by the Chinese government, exports stopped and PET is currently being stockpiled. Lead-acid batteries are packed onto pallets to IMO specifications and shipped to Korea under a Basel Permit. All operations take place in the Betio Materials Recovery Facility, which also has an e-waste collection point and a scrap metal collection pile.



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Lessons Learnt

■ Satellite Collection Points

With cars being small in number in Kiribati, especially in the early 2000s when the recycling system was set up, it was essential to provide good access for people to bring in their cans & bottles for recycling. This was achieved by buying some old shipping containers, and repainting them yellow and with the 'Kaoki Maange' logos. These were placed in public places at four locations along the 40 km road that connects the islands of South Tarawa. This put a far larger number of people within walking distance

of a Collection Point; I-Kiribati are happy to walk long distances, and so people would carry large sacks of cans & bottles to the Collection Point and get their money. This aspect was particularly important given that much of the collection work is done by unemployed people, and so any cost of bring in cans & bottles was a significant barrier to making money. It appears that because Collection Points were easier to access, recovery rates were high and a number of informal jobs were created for low-income people.

■ **Collection of Legacy Waste**

The system started initially collecting aluminum cans in 2004, using some funding from UNDP. At first, 2¢ per can was paid out, and this had the effect of bringing in much easy-to-find can litter that was lying around South Tarawa. There had been a company buying cans before, at about 1¢ each, but not many cans came in. Once crushed, and exported and sold, the project used the money from selling the cans to buy more cans through 2004. The impact of this measure was that by 2005, when the law came into effect to levy deposits and pay refunds, a significant part of the legacy waste had been collected. This was very fortunate, as only \$25,000 was allocated for seed money, far too little in reality. Once a can was worth 4¢ each, people started to dig up old dumpsites, and take the cans to the sea and wash them before redemption. PET bottles were not present in large numbers in Kiribati at this time, which made the system start-up much easier as the cans had a value at the time of around 3¢ each when sold for export.

■ **Naming the System**

Probably the greatest single success of the system, besides cleaning up a vast litter of old cans & bottles on South Tarawa, was the name provided to the system. Having a good name is very useful to clearly identify what is being talked about with the recycling system. Initially, as there was no word in Kiribati for recycling, a number of words that were a Kiribati-sounding version of 'recycling' were tried, but none stuck. At a workshop run by FSPK fairly early on in the system development, the various participants were asked to brainstorm a name for the system. They discussed what recycling meant, and decided it was all about returning the rubbish (as the rubbish all came from overseas on ships). So the name 'Kaoki Maange' which means 'send back the rubbish' was adopted and tried out on the public, and immediately got traction and went very well; it also appealed to the Kiribati sense of humor as an easy answer to the waste crisis engulfing South Tarawa was simply to send it back! The same name was used in a variety of plays, radio spots, adverts and posters promoting the system, all under the general slogan *Kiribati Te Boboto*, which means something along the lines of 'Make Kiribati Beautiful', and this engendered some civic pride in the islands and encouraged people to clean up around their places and tackle the out-of-control waste problems present.



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Reference:

Kaoki Maange Recycling Operation Environmental Report, November 2020, Environment & Conservation Division, Kiribati.

(Author: Mr. Alice Leney, J-PRISM II; Editor: Ms. Mayu Nomura, J-PRISM II)

Case 3

Kosrae State Federated States of Micronesia

Population: 6,616 (National Census, 2010)



Background/ History of the Deposit Scheme

Kosrae had an aluminum can deposit & refund system commencing in 1991, run by the Kosrae Community Action Program, a government supported NGO. But the system collapsed later in the 1990s. In 2006, UNDP funded a feasibility study to look at re-starting and expanding the system, following the success of UNDP support for recycling in Kiribati. In 2007 the new system started after the old legislation was repealed and a new version put in place, that included PET and glass bottles, as well as aluminum cans, and also lead-acid batteries. The new system was tendered out to a local business, who also operated a hotel and tourism operation. The State collected the deposits and paid out refund claims. The State also provided space for an MRF at the Okat Port building, which backed onto the container wharf. The recycling rate when the system started was over 90%, but by 2017 it had dropped to around 86%, with a higher rate for aluminum cans but the PET rate was less at around 63%, with a total of around 1.2 million cans & bottles and over 700 batteries, in 2017. However, in 2018 the State government cancelled the lease on the MRF so the building could be re-purposed, and provided a new location near the High School. With the start of the pandemic the system stopped but restarted in the mid 2021.

Table 13 Kosrae State Redemption Result 2017

		Number of Items		Redemption Rate (%) *1	Recycling Rate (%)
		(/y)	(/y/person) *2		
Aluminum cans	Refunded	1,189,500	179.79	104%	N/A
	Deposited	911,856	-		
PET bottles	Refunded	228,400	34.52	79%	N/A
	Deposited	289,263	-		
Glass bottles	Refunded	64,000	9.67	37%	N/A
	Deposited	175,479	-		
Lead-acid batteries	Refunded	890	0.13	N/A	N/A
	Deposited	N/A	-		

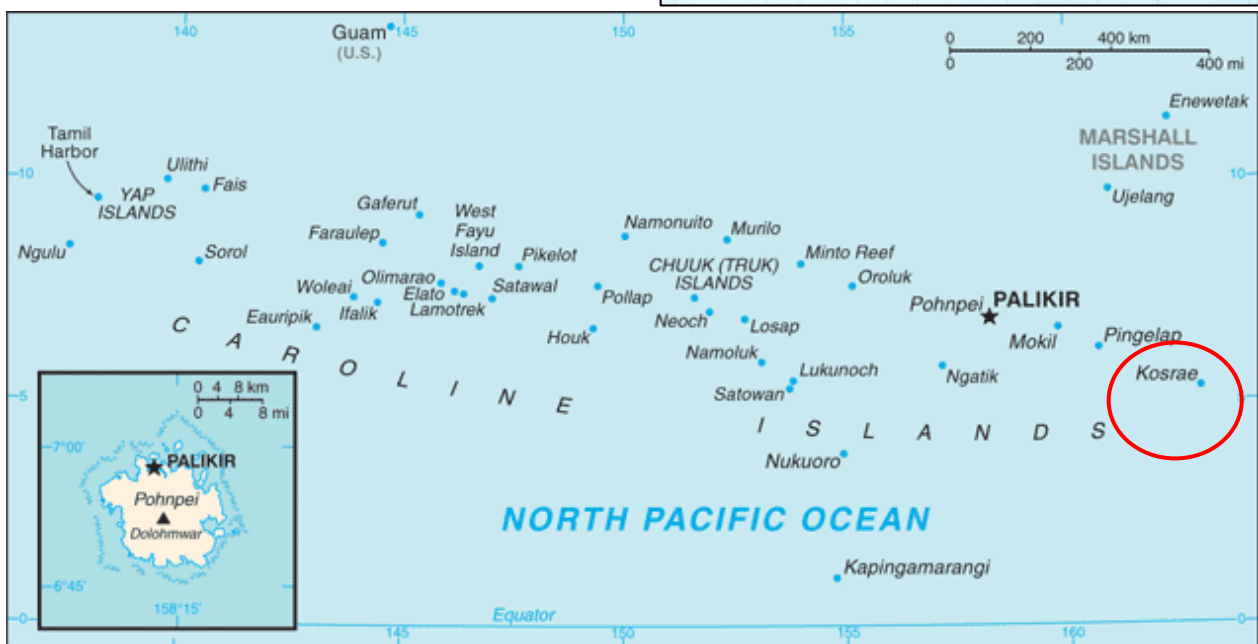
Source: Assessment of the Kosrae Container Deposit Legislation and Recycling System Operation, J-PRISM II, November 2017

(*1) The data was calculated by the formula: $100 \times (\text{no. of items refunded} / \text{no. of items deposited})$

(*2) was calculated from the number of redeemed materials in 2020 with the population 2010.

Geography, Industry and Logistics

Kosrae is the smallest of the four states of the FSM. It is a single island, and the most easterly island of the FSM. It is a high island with a jungle-covered mountainous interior and the inhabitants live around the coastal strip along two-thirds of the coast. Population is falling due to an aging demographic and out-migration to the USA, with current population (2020) expected to be around 5,000. The State has a single port, at Okat, which is where the airport is also sited. The MRF was located at the government-owned port warehouse building until 2018, when the building space was reallocated by the government for another use. Since then, the recycling system Collection Point and processing has moved to a building alongside the High School gymnasium. There are no local bottlers, and all drinks are imported. There is a single main road, and four villages spread around the island, but the road does not encircle the island. Previously, a truck was used to have a mobile collection point that visited the villages twice a month, but once the truck was no longer fit for use, all collections are at the main centre.



Source: University of Texas Libraries

Overview

1. Legal Framework

In 1991 the State Legislature passed State Law 5 –15, Chapter 22, Section 9.2201: "Beverage Container Recycling Deposit" that only covered aluminum cans. In 2006 this was repealed as it was no longer functioning, and was replaced with the Kosrae Recycling Program Act. In 2007 the Recycling Program Regulations were passed, and the recycling system started.

- Kosrae Recycling Program Act
- Recycling Program Regulations

2. Fund

The Recycling Collection Program Account is the recycling fund operated by the Kosrae State Department of Administration. This fund collects deposits at import and pays out refund claims to the recycler.

3. Agencies

Table 14 Agencies Involved for Kosrae State CDS

Agencies	Roles
Kosrae Island Resource Management Authority (KIRMA)	Regulatory agency of the programme. They are nominally the Recycling Agent under the legislation. Development, promulgation and amendment of the legislation/regulations is their duty. KIRMA originally worked with UNDP to get the system operational, before contracting out the operation to the System Operator.
Department of Administration of Kosrae State Treasury	Collects the deposits from producers (importers) and pays out refund claims from 'The Recycling Collection Program Account' to the System Operator, and manages the Fund as part of its Treasury functions.
Micronesia Eco-Corp (The 'System Operator') (Micronesia Eco-Corp was the contracted System Operator until the system stopped. They are also involved in tourism)	They are the 'System Operator' which actually operate the system in the state under the contract with KIRMA. The duty is specified in the contract. e.g. Operate MRF which is also the single Collection Point, make refund payment to consumers, handle counting, process items (crushing/ bailing), export overseas for recycling, as well as repurpose redeemed materials domestically.

Producers (importers)	Pay the deposits on the target items that they produced/ imported in accordance with the HS number in the national Custom Tariff. Importers provide the required information to the Custom.
Consumers	Recover the target items to the 'Collection Point' in a designated manner.

5. Deposit Rate/ Refund Rate/ Handling Fee

Table 15 Deposits, Refunds, Handling Fee (Kiribati)

No.	Target Items	Deposit (USD/container)	Refund (USD/container)	Handling Fee (USD/container)
1	Aluminum/ metal cans	\$0.06	\$0.05	\$0.01
2	PET beverage bottles	\$0.06	\$0.05	\$0.01
3	PET cooking oil bottles	\$0.06	\$0.05	\$0.01
4	Glass beverage bottles	\$0.06	\$0.05	\$0.01
5	Lead-acid battery	\$4/unit	\$3/unit	\$1/unit
Conditions				
Any size of aluminum cans, PET bottles, and glass bottles is accepted.				
All lead-acid batteries.				

5. Flow/ Management of Money and Goods

<<Deposit Payment (Point of Levy)>>

Deposits are collected by the Kosrae State Department of Administration when importers pay their Kosrae State sales tax before they can clear their cargo at Okat port through FSM Customs. However, once the import entry is filed, importers have 120 days to make the actual payment, which matches a rule about payment of State Sales Tax. This can result in some disruption to recycling rates if a business goes bankrupt whilst still owing deposits but refunds have been paid out, and this has happened in the past. Target items are defined in the Regulations and by HS number in the FSM Customs tariff. There are no registration requirements for importers. However, it must be noted that sometimes deposits are wrongly recorded as to type of bottle or can, particularly in the case of beer, which may account for low glass and high can recycling rates.

<<Refund Payment (Point of item collection and redemption)>>

The Collection Point at the only MRF was open one day every two weeks after the initial start up phase. This is because absolute numbers returned are low due to the small population. The recycling system is essentially a part-time operation. Materials must be clean and whole, and a minimum quantity of five items of cans & bottles is specified in the Regulation so that the minimum payout is 25¢. People are paid refunds in cash at the time of redemption of the items.

<<Fund Management>>

The Fund is called the Recycling Collection Program Account, The Kosrae State Department of Administration collects the deposits and pays out refund claims, and manages the Recycling Fund, as part of its Treasury functions. Claims are made using a standard numbered Certificate Claim Form and processed by the State Treasury monthly. For some years deposits were less than refunds, partly due to the 120 day grace period for payment of deposits, but since 2016 the situation has improved with better management. Refund claims are processed immediately that day under the legislation. The legislation does allow for payments from the Fund to be for '*The amount of any expenditure by the State on the costs of recovering waste materials;*' this allows the State to spend money on infrastructure support if required and funds allow.

6. The End of Use Management

The System Operator counts cans & bottles by using wire baskets of 500 units each for cans and 300 units for PET. Glass is hand counted, although for some years a bottle crusher was used that crushed each bottle individually and had a counter on it. The System Operator bales the aluminum cans with a small baling press that crushes about 100 cans at a time, and gets around 10 to 11 tonnes per 20ft shipping container. The same press is used to bale PET, but these bales are not very tight and fall apart easily. One big issue with such a small press is that the labor effort is quite big compared to the amount crushed, and so increases costs. Shipments are infrequent, and amount to around one to two containers per year. Battery shipments take a long time to build up, as a Basel Permit is required to ship batteries, and as a permit lasts only one year, it makes sense to get enough batteries for two or three container loads before getting a buyer and a permit. Glass bottles have been crushed with a small crusher, two types have been used since the system started. The crushed glass is low in quantity and used for filling potholes and puddles in the container yard, and also as a sand substitute for non-structural concrete such as footpaths at a local hotel. PET bales have been shipped at a loss, but have also been used experimentally as wall fill inside wooden framing for building, which has proved successful in terms of insulation and termite proofing. Batteries and aluminum cans are sold to an Australian company who acts as intermediary as quantities are so low, but materials are shipped to South Korea. However, in the last two years only aluminum cans have been exported due to the difficulties described above.



Footpaths made of sand mixed with crushed glass

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Lessons Learnt

■ **Adjustment to Deposit Rate**

In 2017 J-PRISM II, JICA project, conducted a mission to Kosrae to analyze the current state of the deposit refund system. The resulting report determined that the quantities of materials coming in were falling due to a falling and aging population. This meant that the income to the System Operator was getting very low, and no longer commercially viable, but the existing System Operator continued to run it as they felt this was an essential service for the island, and also important to contribute to tourism, in which they also had a business interest. The study determined that PET should no longer be shipped until the market improved, and used locally, as this was costing significant money over the handling fee received; another cost improvement measure would be to get a bigger baling press that would crush the cans to a higher density, thus get more cans into a container, and so cut the shipping cost per tonne. If a press that could bale 15 tonnes per container was bought, then only about one container of cans per year would be shipped. It would also mean much lower labor cost as such a press bales 500 cans in one cycle as opposed to 100 in the small press. Such a press would also make the PET bales tighter too. Another way to improve the economics of the Kosrae system would be to raise the deposit. This would leave the refund unchanged, but the extra amount would be added to the handling fee, so increasing income to the System Operator. As the deposits are paid in large sums on many items, the deposit can include a fraction of a cent. The danger is that if the existing system is left as it is, when the current operator gives up, as they will sooner or later, no other business is likely to take it on as the system makes no money.

■ **Mobile Collection Points**

Due to the sparse population, and that people are spread around much of the coast of the island of Kosrae, the original design for the system included a small flat-bed truck as a Mobile Collection Point. Every two weeks, the truck would visit each of the four villages on the island, and take its can & bottle counting baskets along, and count cans & bottles and buy them from people. The recycling system cashier went along with the truck driver and his assistant, and cash was paid out and all the normal record keeping done, but by the side of the road.



The truck was loaded up with items and then taken back to the MRF for processing. The main Collection Point at MRF remained open weekly at the usual times. This system made it much easier for people to take in their cans, as it was particularly noted that it was women who were predominant in bring in cans & bottles for redemption, yet they often didn't have good access to a car in work hours to be able to bring their cans and bottles to the main Collection Point, which is at one end of the long road around the island. However, once the original truck failed, donated by UNDP as part of the original project,

the cost of a new truck has prevented the mobile Collection Point operating, and recycling rates have fallen as a result.

■ **Alternate use for PET and Glass**

The System Operator, Micronesia Eco-Corp, was faced with a big loss-making operation with regard to PET and glass if it was to be exported. Quantities were low, and the PET was baled in the same crusher used for cans, but that machine could barely crush cans densely enough for viable export, and PET bottles are very difficult to crush and keep crushed. The glass was crushed in a small machine, designed for use in large hotels that took one bottle at a time and turned it to fine crush, and this glass was first used to fill in puddles and potholes in the shipping container yard.



After that, it was found to be very useful when mixed with concrete as a sand substitute, suitable for paths and drive ways. This has used up all the crushed glass, which is small in quantity. For the PET bales from the small crusher, they are roughly 1 foot square and four inches thick; these have been found to be useful to be used to fill in the gaps in wooden framing of new-build buildings, and then held in place with wire netting, which is then plastered over to make the wall. Such walls have been found to be termite proof. But unfortunately the amount of PET is greater than the local use, so the PET is used in the landfill to help with building up cell walls. Whilst the PET in landfill is not recycled, it is crushed and takes up much less space than otherwise, but crucially, many of those bottles would have escaped as litter and gone into the sea and the bush if the recycling system were not in place.

Reference:

Assessment of the Kosrae Container Deposit Legislation and Recycling System Operation, J-PRISM II, November 2017

(Author: Mr. Alice Leney, J-PRISM II; Editor: Ms. Mayu Nomura, J-PRISM II)

Case 4

Yap State Federated States of Micronesia



Population: 11,400 (National Census, 2010)

Background/ History of the Deposit Scheme

Yap had a legislated aluminum drink can deposit refund system operating from late 1995, but it stopped working after the massive Cyclone Sudal damaged Yap State in 2004. In 2006 UNDP conducted a feasibility study on introducing Container Deposit Schemes into each of the four states of the FSM, and in 2007 UNDP supported Technical Assistance to Yap State to help re-start the system. This required repeal of the existing law, and the passing of a new Act, which then included the power to regulate, and the system now included glass and PET beverage containers, and PET cooking oil containers, as well as aluminum beverage cans. A local company invested in a large scrap metal baling press, and this was installed in a government-owned disused fish processing building at the end of the Colonia peninsula, which became the system Materials Recovery Facility (MRF) and collection point. The Recycling Agent who was engaged in 2007 at the start of the current system, Island Paradise Metal Company, remains in place. As of the writing the new MRF is planned to be constructed at the state landfill site.

Table 16 Yap State Redemption Result 2021

		Number of Items		Redemption Rate (%) *1	Recycling Rate (%)
		(/y)	(/y/person) *2		
Aluminum cans	Refunded	3,437,475	301.53	138.75%	N/A
	Deposited	2,477,432	-		
PET bottles *3	Refunded	489,605	42.95	55.99%	N/A
	Deposited	874,502	-		
Glass bottles	Refunded	6,487	0.57	6.45%	N/A
	Deposited	100,509	-		
Total	Refunded	3,933,567	345.05	113.94%	N/A
	Deposited	3,452,443	-		

Source: Yap State Environmental Protection Agency Recycling System Summary Report 2021

(*1) The data was calculated by the formula: $100 \times (\text{no. of items refunded} / \text{no. of items deposited})$

(*2) The data was calculated from the number of redeemed materials in 2021 with the population 2010.

(*3) The data includes 300 of PET cooking oil bottles

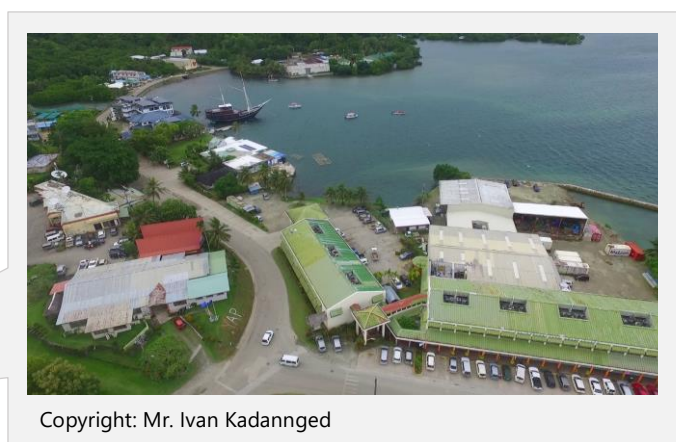
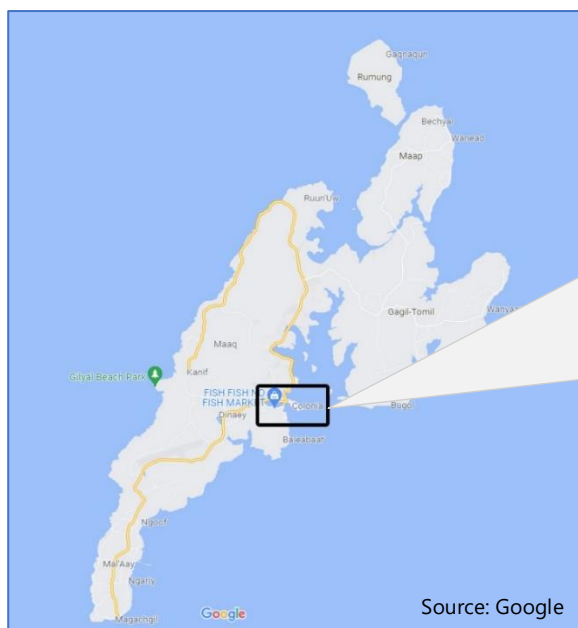
Table 17 Yap State Redemption Rates (all items)

Fiscal Year	Deposits (USD)	Refunds (USD)	Redemption Rate (%)
2009	2,407,726	0	0.00
2010	2,994,528	2,705,923	90.36
2011	2,904,417	3,188,380	109.78
2012	2,641,418	3,409,343	129.07
2013	2,519,273	2,515,288	99.84
2014	2,393,470	2,559,955	106.96
2015	2,793,039	2,489,545	89.13
2016	2,927,728	2,823,104	96.43
2017	3,154,801	2,712,991	86.00
2018	3,316,812	2,753,579	83.02
2019	3,080,442	2,782,270	90.32
2020	2,980,528	3,120,145	104.68
2021	3,452,443	3,933,567	113.94

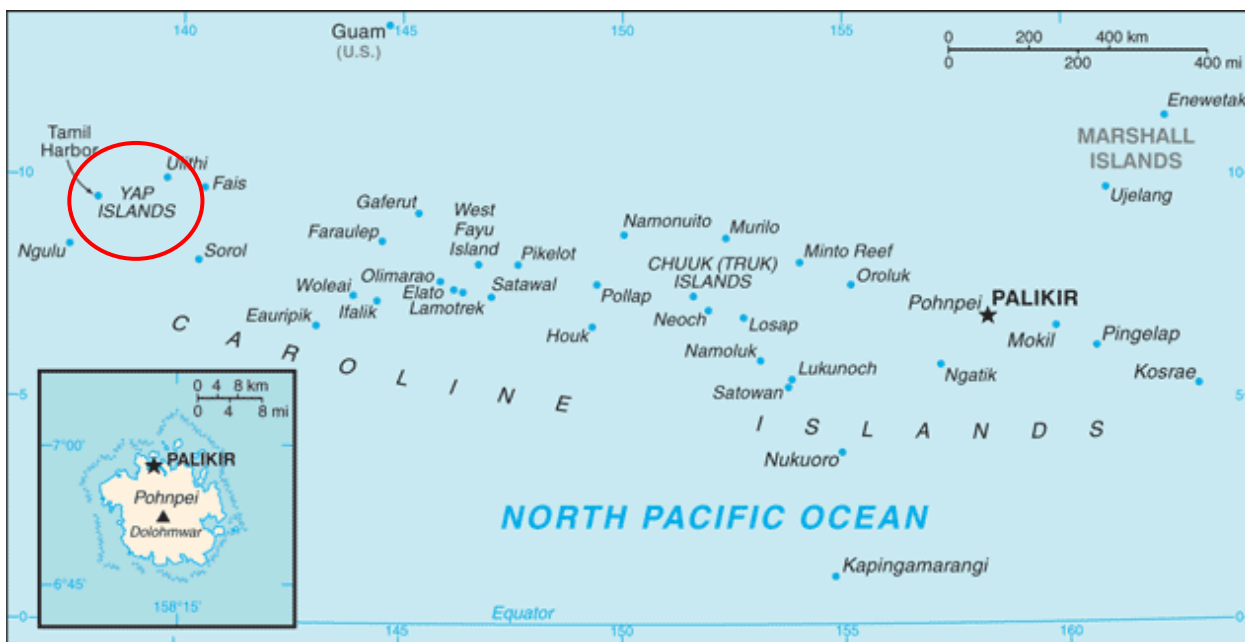
(Source: Yap State Environmental Protection Agency Recycling System Summary Report 2021)

Geography, Industry and Logistics

Yap State is made up of Yap Main Island which the capital, Colonia, is located and fourteen neighboring island atolls stretching to the east for about 800 kilometers (500 miles). Two thirds of the population lives on Yap Main Island, and most of the consumption takes place there. There is a single port at Colonia, the State capital, which can handle shipping containers. There are no local bottlers, and all beverages are imported. There is some tourism based on diving, particularly for observing the local Manta Ray population. Most people on Yap Main Island live in villages spread around the island, and the main town is very small and not densely populated, with few residents. Many people have cars - or access to one - and the road network covers three of the four islands of Yap Main Island, which are separated by narrow channels joined by causeways.



Copyright: Mr. Ivan Kadannged



Source: University of Texas Libraries

Overview

1. Legal Framework

The Recycling Act was passed by the Yap State Legislature in 2007 along with amendments to the Taxation & Finance law under the Yap State Code. This was followed by passage of its corresponding Regulations by the Yap State Environmental Protection Agency. There was one minor amendment to the Recycling Act where it was amended to be included under Title 18 Environment and Conservation of the Yap State Code.

- Repeal of Section 115 Title 13 of the Yap State Code
- Yap State Recycling Act: Yap State Law 7 – 18
- Amend Title 13 Taxation and Finance to create the Recycling Collection Program Account as an Enterprise Fund and allow for collection of deposits per Regulations
- Yap State Recycling Program Regulations
- Service contract between Yap State Government and Island Paradise Metal Company

2. Fund

The Enterprise Fund which holds the Recycling Collection Program Account

3. Agencies

Table 18 Agencies Involved for Yap State CDS

Agencies	Roles
Yap State Environmental Protection Agency (EPA)	Regulatory agency of the programme and its overall administration. Regulate and compliance monitoring of 'Recycling Agent' in line with the legislation; development, promulgation and amendment of the legislation/ regulations.
Yap State Office of Administrative Services (OAS)	Monitor the Recycling Agent, handle all financial transactions.
Yap State Division of Finance and Treasury	Manages and operates the Enterprise Fund, regularly updates all financial summary of Program and shares with Yap EPA. Compiles deposits information from Division of Tax and Revenue and pays out refund claims from the fund to the Recycling Agent.
Yap State Division of Tax and Revenue	Collect deposits from producers (importers) and accounts for them into 'The Enterprise Fund.'
Island Paradise Metal Company (The 'Recycling Agent') (Island Paradise Metals is the contracted Recycling Agent.	Operates the system under a service contract with Yap State Government. Duties are specified in the contract e.g. Operates MRF as Collection Point, makes refund payment to consumers, handles counting, , process items (crushing/ baling), and exports overseas for recycling and domestic use. Makes weekly claims against the Fund to State Division of Finance and Treasury. Also operates system according to Recycling Regulations.
Producers (importers)	Pay the deposits on the target items that they produced/ imported to State Division of Tax and Revenue (OAS) in line with State taxes also collected by this Division.
Consumers	Recover the target items and turns them in to the MRF as only 'Collection Point' in a designated manner.

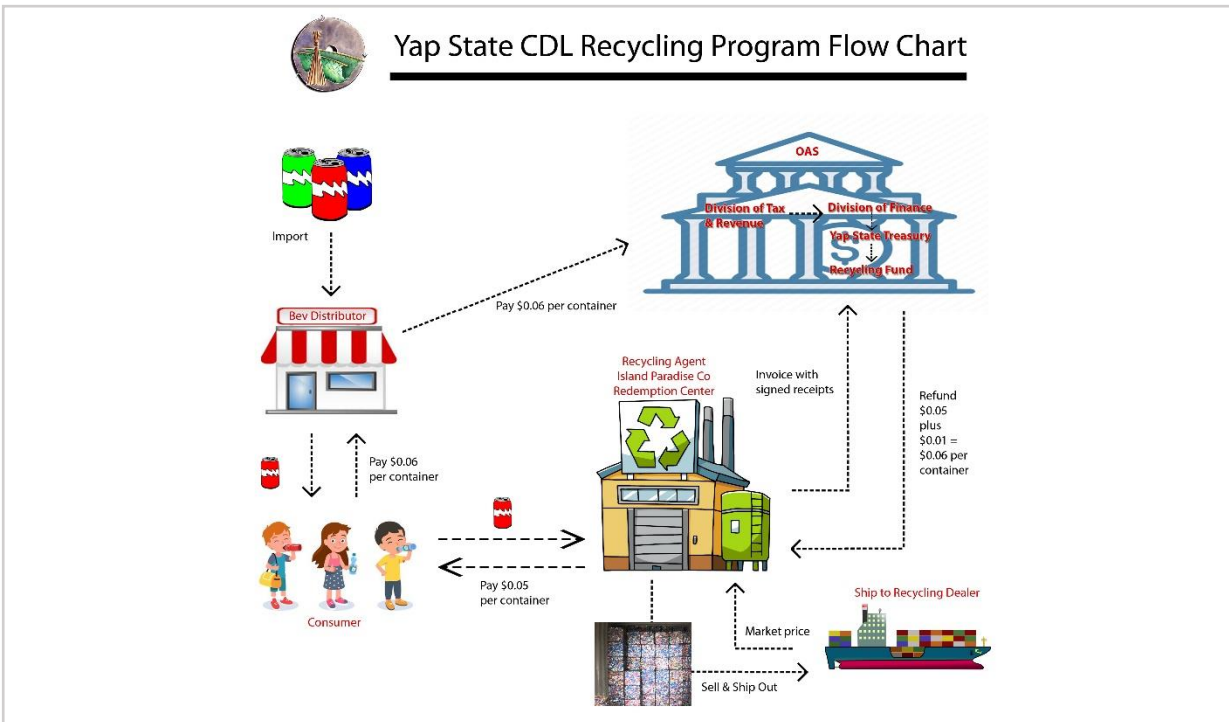
4. Deposit Rate/ Refund Rate/ Handling Fee

Table 19 Deposits, Refunds, Handling Fee (Yap State)

No.	Target Items	Deposit (USD/container)	Refund (USD/container)	Handling Fee (USD/container)
1	Aluminum beverage containers	\$0.06	\$0.05	\$0.01
2	PET beverage containers	\$0.06	\$0.05	\$0.01
3	PET cooking oil containers	\$0.06	\$0.05	\$0.01
4	Glass beverage bottles	\$0.06	\$0.05	\$0.01

Conditions
Aluminum cans cover all beverage cans.
Any size of cans and PET bottles is accepted.
Minimum number for redemption is 5 units (25¢ refund).
Items must be whole, with caps and labels off, and clean.

5. Flow/ Management of Money and Goods



(Source: EPA, Yap State)

<<Deposit Payment (Point of Levy)>>

Deposits are collected by the Yap State Division of Tax and Revenue when importers pay their Yap State sales tax before they can clear their cargo through FSM Customs. Importers have the same grace period to pay deposits as they do with Yap State taxes on these items. Target items are defined in the Regulations. There are no registration requirements for importers.

<<Refund Payment (Point of item collection and redemption)>>

There is a single Collection Point, the MRF, located at the end of the Colonia peninsula which was formerly used as tuna processing and transshipment facility. The MRF is open three days per week, from Wednesday to Friday. Counting for aluminum cans & PET bottles is by using wire baskets of average 500 units each for cans and average of 300 units for PET; the same baskets are used for both materials. Glass beverage bottles are hand counted. People receive cash at the time of redemption.

<<Fund Management>>

PET cannot be sold, so the PET is in storage as of late 2018. Glass is the only material that is kept for alternate reuse on island, as the Recycling Agent is not required to export this. Currently, construction of a MRF facility at the Colonia landfill is planned, to allow for relocation of the MRF and additional space for storage, as well as processing.

Lessons Learnt

■ ***Support from the Private Sector***

The support of the local private sector scrap metal operator was essential to get the program off the ground. Yap had limited initial funds through the United Nations Development Programme (UNDP) and assistance through its Technical Advisor. These funds assisted with pilot buy back projects when changes to the Recycling Program were being made as well as outreach and awareness activities.



Arranging a project, with funding and an implementation plan, would normally take quite some time. But a local business, Yap Island Paradise Metal Company purchased the needed equipment beforehand as it started out as a scrap metal buyer, made a proposal and entered into an agreement with the government to serve as Recycling Program Operator. The State Government leased an old Yap Tuna Fish Processing Building, which had previously served fishing boats. This was at the main wharf in the centre of Colonia town, and so a good central location that could serve all the people on Yap Main Island. It also meant that people coming in from the Outer Islands could bring bags of cans in on the inter-island ships and drop them straight off at the recycling center when the field trip ship came in. Because Island Paradise Company and the government cooperated so quickly, changes to the Program could be implemented, collecting and baling cans and bottles. With the PET bottles only being around 20% of the total beverage containers, most of the materials were aluminum cans, and baling these with a big scrap metal press, and exporting them promptly, ensured that a good cash flow returned to the recycler fairly quickly. Cash-flow is often one of the most difficult issues at start-up of a new system.

■ ***Legacy Waste Finance***

Because Yap had a previous program that accepted aluminum beverage cans for about nine years and with the disruption caused by Typhoon Sudal, there was an accumulation of aluminum cans on island. The fund that was supporting this program had been accumulating as well; these funds were previously appropriated by the Yap State Legislature for use with the program. This same fund was targeted to continue supporting the program with the new changes implemented as a true CDL Recycling Program, however a provision in the Recycling Act that was passed prevented this. As a result, Yap State EPA and partner entities such as OAS and Island Paradise Metal Company had to wait for almost a year to build up a new fund to support the new program. This was done by implementing the increased deposit

rates being collected but delaying the issuance of increased refund rates. During this time, the added challenge posed was that the public was aware of plans to implement increased refund rates and so they held on to their recyclable materials until such time. These more recent aluminum beverage cans were in addition to those that had accumulated since Typhoon Sudal had caused the program to stop. Once increased refund rates were issued to customers, there was a large influx of recyclable materials turned in to the Program for some time.

■ **Counting Cans and Bottles**

In Yap, because many cans had been collected for a long time after cyclone Sudal and before the system restarted in 2007, and some cans came in from the neighboring islands too, people had often squashed the cans by hand when building up a collection to save space. This meant that if the basket system was used, people who brought in crushed cans would get less for them. Particularly for people coming from the



neighboring islands who had to bring their cans to Colonia in sacks on a ship, hand crushing the cans is important to keep their costs down and make it easier to travel. In view of this, the Recycling Agent used a hand counting system at the start-up phase, where the cans are tipped out on to a table that feeds into the press, and the cans and bottles are counted by hand as they are fed into a press. This built confidence in the public that the system was fairly paying for their cans (only aluminum cans had been stockpiled after Typhoon Sudal as the old system only took cans). However, after the initial stockpiles were cleared, an effort was made through outreach and awareness activities to get people NOT to crush their cans, so that a switch was made to using the counting baskets, which sped things up with processing the recyclable materials and benefitting customers too who had less wait time. Anyone bringing in materials can have them counted at the Recycling Center/MRF if they wish, however they are asked to do this themselves. Since the counting baskets measure the containers by volume of average size of cans (estimate 500 cans per basket), there was some initial skepticism and push back from community members and customers as cans counted might be slightly more than 500 average when turning in materials one day, and then slightly less than 500 average on another. However, the counting and processing of cans has become quicker and more efficient and as customers are encouraged to participate in the Recycling Program regularly, the total counts of cans will average out over time. PET containers vary far more greatly in size than aluminum beverage containers and this is why their average count per counting basket is lesser.

Reference:

Yap State Environmental Protection Agency Recycling System Summary Report 2020

(Author: Mr. Alice Leney, J-PRISM II, Ms. Ms. Christina Fillmed, Executive Director, Environmental Protection Agency in Yap State, the Federated States of Micronesia; Editor: Ms. Mayu Nomura, J-PRISM II)

Case 5

Republic of Palau

Population: 18,001 (WB, 2019)



Background/ History of the Deposit Scheme

An act establishing a recycling program and creating a recycling fund was passed by the 7th national congress 'OLBIIL ERA KELULAU (OEK)' in October 2006 (RPPL: The Republic of Palau Public Law No. 7-24). This enabled Palau to operate a beverage deposit scheme. However, the regulatory agency (Division of Solid Waste Management of the Bureau of Public Works) was short of capacity to run the recycling program as they were in only their second year of operation after establishment. In addition, a project for establishing recycling facilities was in progress by Koror State Government, which then became the initial Redemption Center for the recycling program. Given this situation, the decision was made to put on hold implementation of the recycling program until the responsible personnel were well trained, which happened through a three-year JICA project which ended in 2008. In 2009, the Beverage Container Recycling Regulations were put into effect. Implementation started in April 2011 with a six-month deposit collection without redemption, to build up funds to pay for legacy waste. Operation of the collection point was contracted to the Koror State Government by the National Government, which enabled the public to bring in their beverage containers and get paid refunds from October 2011. The Container Deposit Scheme has been operating well since with only some minor changes, for example, getting another redemption center on board in 2016, lifting the size limitation of acceptable beverage container in 2019, and in recently including steel food containers such as used for tinned tuna.

Table 20 Palau Redemption Result 2020

		Number of Items		Redemption Rate (%) ^{*1}	Amount of Export (kg)
		(/y)	(/y/person) ^{*2}		
Aluminum cans	Refunded	8,863,965	492.42		150,479.5
	Deposited	N/A	-		
PET bottles	Refunded	4,183,080	232.38		133,889
	Deposited	N/A	-		
Glass bottles	Refunded	404,633	22.48		0
	Deposited	N/A	-		
Steel cans	Refunded	217,881	12.10		13,484
	Deposited	N/A	-		
Tetra pack	Refunded	527,700	29.32		0
	Deposited	N/A	-		
Total	Refunded	14,197,259	788.69	84.34%	
	Deposited	16,832,711	-		

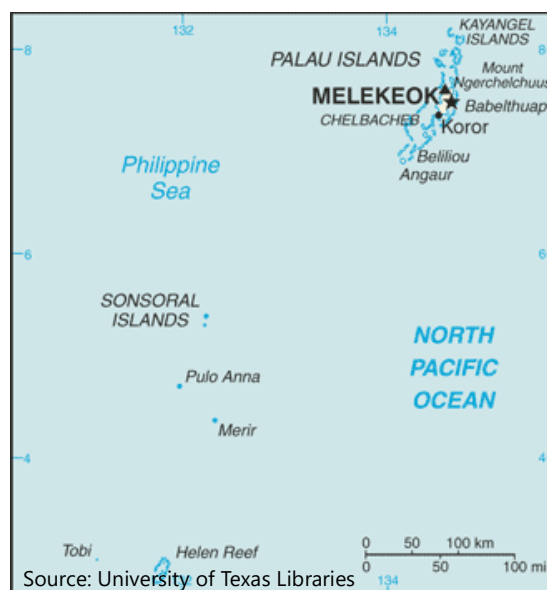
Source: Beverage Container Recycling Program Annual Report FY-2020, Republic of Palau Division of Solid Waste Management Bureau of Public Works, MPIIC

(*1) The data was calculated by the formula: $100 \times (\text{no. of items refunded} / \text{no. of items deposited})$

(*2) was calculated from the number of redeemed materials in 2020 with the population of 2019.

Geography, Industry and Logistics

The Republic of Palau is an island country made up of 16 states composed of over 340 islands, nine of which are inhabited. The most populous commercial and administrative center is Koror Island where two thirds of the population reside, and which is connected by road to the largest island, Babeldaob. The two national landfill sites are located in these islands. Malakal Harbor is the main port of Palau located in the protected lagoon area of Malakal Island, adjacent to Koror. Shipping services are provided through Kyowa, Matson Navigation, PIL/ Mariana Line shipping companies, and typical routes come from Guam and Asia through Yap State of the FSM, and go on to Pohnpei State.. The three major supermarket chains of WCTC, Surangel, and Payless bring in most of the imported drinks. Local beverages are produced by 4 local bottled water manufacturers and one local beer company, and these companies are required to pay deposits on the empty containers, or PET preforms used to make bottles, at import. The abundant natural attractions such as coral reefs, mangroves, and cultural heritage items attribute to the thriving tourism industry. GNI per capita is 17,280 (WB, 2018) which is relatively high for a Pacific Island Country.



Overview

1. Legal Framework

- Chapter 16: Recycling Program, the National Code Title 11: Business and Business Relation
 - RPPL No. 7-24 to establish the recycling program for the Republic of Palau, establish a beverage container deposit fee, create a recycling fund, and for other related purposes.
 - RPPL No. 10-14 to amend Section 1604 (Recycling Fund) of Chapter 16 of the National Code Title 11 to expand the use of the Recycling Fund to activities consistent with the Section 2103 (Ban on importation of plastic products) of Chapter 21: Plastic Bag Use Reduction Act.
 - RPPL No. 10-31 to amend Chapter 16 of the National Code Title 11 to expand the definition of the 'deposit beverage' so it includes any liquid intended for human consumption and to eliminate the thirty-two (32) ounce size limitation for deposit beverage containers, and for other related purposes.
- Beverage Container Recycling Regulations 2006 *RPPL No. 7-24
- Amended Beverage Container Recycling Regulations 2009 *RPPL No. 10-14
- Amended Beverage Container Recycling Regulations 2019 *RPPL No. 10-31
- Memorandum of Understanding (MOU) between Ministry of Public Infrastructure, Industries & Commerce, Ministry of Finance and Koror State Government

- Memorandum of Understanding (MOU) between Ministry of Public Infrastructure, Industries & Commerce, Ministry of Finance and Belau Garbage & Scrap Company
- A contract between Ministry of Public Infrastructure, Industries & Commerce and Palau Waste Collection Company.

2. Fund

The Deposits are held in a revolving fund which is called the 'Recycling Fund' maintained by the Ministry of Finance, separate and apart from other funds of the National Treasury.

Under the law, the Ministry applies the Recycling Fund to administration of the Recycling Program, and also to recycling education, plastic education programs related to ban on plastic Import, and recyclable market development activities.

3. Agencies

Table 21 Agencies Involved for Palau CDS

Agencies	Roles	
Ministry of Public Infrastructure, Industries and Commerce (MPIIC)	Regulatory agency of the program. Development, promulgation and amendment of the legislation/ regulations. MPIIC approve and regulates the 'Redemption Center' in line with the legislation and MOU. Ensures that the redeemed containers are exported.	
Division of Solid Waste Management, Bureau of Public Works of MPIIC (DSWM-BPW, MPIIC)	Administer and implement the program under the MPIIC. Monitor the program and develop an annual report based on the reports from the relevant agencies.	
Ministry of Finance (MOF)	Administer the Recycling Fund.	
National Treasury	National Treasury collects deposits from producers (importers) through the Bureau of Customs, Revenue and Taxation Office (BCRT) and places the money in the Recycling Fund. The BCRT office is located adjacent to the port gate entrance.	
Bureau of Customs, Revenue and Taxation Office (BCRT)		
The 'Redemption Center Operators'	Collect recyclable beverage containers and pay refunds to any person who brings such containers to a Redemption Centre, in line with the MOU between MPIIC, MOF, and the Redemption Center Operator.	
1	Koror State Government (KSG)	Operates Redemption Center from October 2011.
2	Belau Garbage & Scrap Co. (BGSC)	Operates Redemption Center from November 2016.

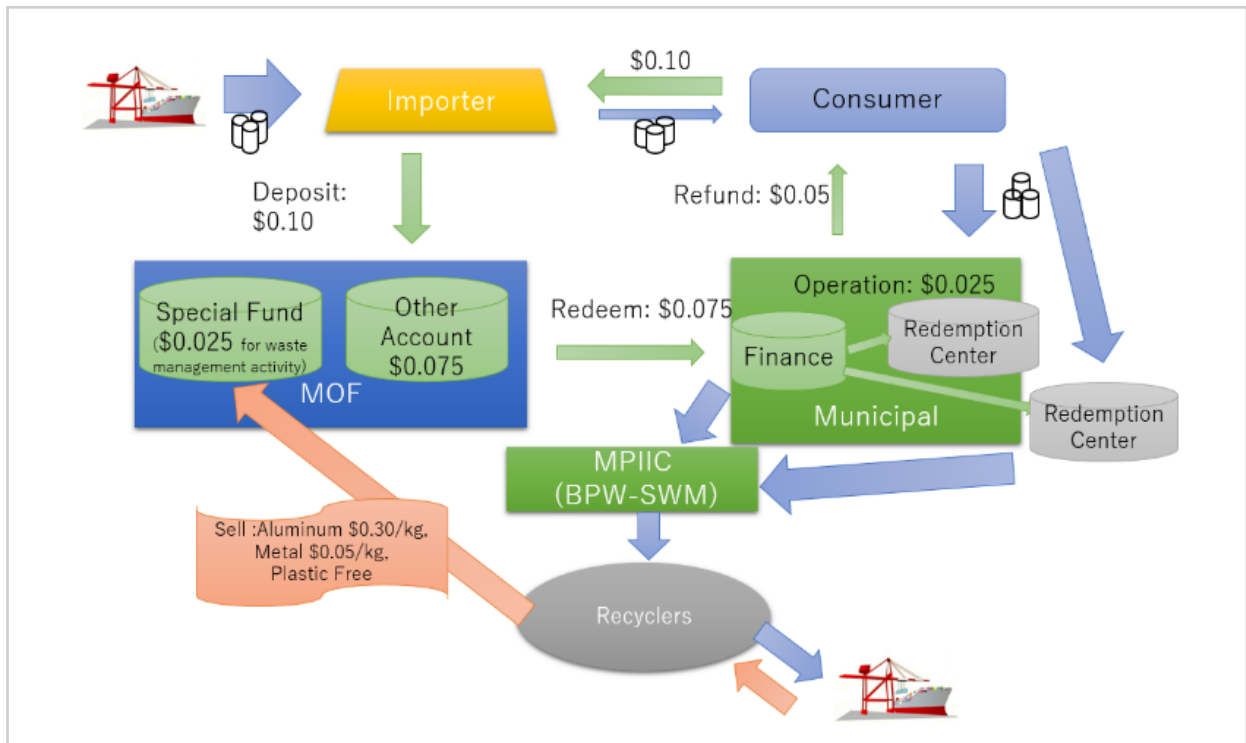
The 'Recycler'		
1	Palau Waste Collection Company	Buys the redeemed containers from the national government for exporting for final treatment in line with the contract with MPIIC. Contract started in July 2012.
Producers (importers)		Pay the deposits on the target items that they imported in accordance with the HS number in the national Custom Tariff. Importers provide the required information to the Custom.
Consumers		Recover the target items to the 'Collection Point(s)' in a designated manner.

4. Deposit Rate/ Refund Rate/ Handling Fee

Table 22 Deposits, Refunds, Handling Fee (Palau)

Target Items	Deposit (USD/container)	Refund (USD/container)	Handling Fee (USD/container) <i>This is called "Compensation cost" in Palau</i>	'Recycling Fund' (USD/container)
Beverage Containers that are made of: <ul style="list-style-type: none"> • Metals (Aluminum or steel) • Plastics (All types) • Glass • Tetra pack containers 	\$0.10	\$0.05	\$0.025	\$0.025
Conditions				
<ul style="list-style-type: none"> • Deposits are also levied on empty containers and PET preforms used for manufacturing beverage products and sold domestically. • All beverage types are accepted except products ingested for medical purposes. • As of writing, amendment of law is being considered in order to include metal-made containers that are used for packaging other than beverage. e.g. such as food tin cans. • Plastic bottles include all types of plastics where used as beverage containers • Size of containers was initially less than or equal to 32 fluid ounces. This limitation was eliminated by the law amendment in 2018 (RPPL No. 10-31) with the regulation amendment in 2019 so that all sizes of containers are accepted from 2019. 				

5. Flow/ Management of Money and Goods



(Source: J-PRISM II)

<<Deposit Payment (Point of Levy)>>

\$0.10 deposit per item is collected by Customs from importers at the port of entry of not only beverages, but also empty beverage containers, and plastic preforms used for manufacturing bottles for local bottling of water. Therefore, it is unnecessary to collect deposits at the time of local manufacturing as the deposits are already paid to the containers at the time of import. In addition, import of waste beverage containers are strictly banned to avoid being brought in for redemption to gain refunds when deposits had not been paid.

<<Refund Payment>>

There are two Collection Points, called Redemption Centers: one is operated by Koror State Government started in 2011 and the other is operated by a private company Belau Garbage & Scrap Co started in 2016. Differences can be found between the two redemption centers in terms of opening hours, accepted items, and counting method, etc. as described in Table 23. Redemption Center Operators are contracted by MPIIC and MOF, and responsible for collection of used beverage containers, refund payment to the public, and processing of containers to prevent multiple refunds. Glass bottles are accepted only at KSG Redemption Center, where they are processed and repurposed for Glass Products. At KSG's Redemption Center, when people bring beverage containers, \$0.05 refund payment is immediately made by the finance division of Redemption Centers in cash if under \$750 per redemption, or by check every Friday if over \$750. Redemption Center Operators make monthly claims to National Treasury for their handling fees (called 'compensation' in Palau) against the Recycling Fund.

Table 23 Operation of the Redemption Centers

	1	2
Operators	Koror State Government (KSG)	Belau Garbage & Scrap Co. (BGCS)
Location	Koror State	Koror State
Opening hours	Monday to Friday, 8:00 to 16:30	Monday to Saturday, 8:00 to 17:00
Accepted items	Aluminum, steel, plastics, tetra pack, glass bottles	Aluminum, steel, plastics, tetra pack
Counting method	Machine	Manual
Minimum number of items that can be brought for redemption	No upper nor bottom limits	No upper nor bottom limits
MOU commenced	October 2011	November 2016
Photos		

<<**Fund Management**>>

The refund of \$0.05 plus the \$0.025 handling fee per item is paid from the Deposit Fee of \$0.10 by the National Treasury in response to the monthly claims from the Redemption Center Operators. Under the act, a quarter of deposits - \$0.025 per item - is retained in the Recycling Fund to be used for waste management activities. This money accumulates in the Fund, as do unredeemed deposits - Those deposits from items not bought back for refund. These funds set aside for waste management use have enabled activities such as designing/ building/ improving the national landfill, purchasing vehicles/ equipment for the landfill, and awareness activities on 3Rs.

Table 24 Expenditures by the Recycling Fund (FY 2011-2020)

Items	Rate (USD)
Construction (Landfill extension, leachate catchment basin, tire shredding facility, etc.)	\$1,471,424.18
Vehicles and Equipment (Bulldozer, excavator, dump truck, etc.)	\$552,590.00
Administration (Office supplies, salary, machinery & equipment repair & maintenance, Fuel for office vehicle, advertising, etc.)	\$1,545,120.70
Awareness Activities (Promotion of 3Rs, recycling bins installation, training, etc.)	\$48,137.88
Grand Total (2011- 2020)	\$3,617,272.76

(Source: Beverage Container Recycling Program Annual Report FY-2020, Republic of Palau Division of Solid Waste Management Bureau of Public Works, MPIIC)

6. Recycled Product Management

Aluminum, steel, and plastics

Once the beverage containers of aluminum, steel, and plastics are collected at the Redemption Centers, they are baled at the site. The beverage containers collected by the Redemption Centers are owned by the National Government (MPIIC)- not the Redemption Center Operators. The export of the collected aluminum, steel, and plastic containers is arranged by the National Government through a contract with a local recycling company - Palau Waste Collection Company. The company buys the collected containers from the National Government at a negotiated rate, and that income goes into the Recycling Fund. The company pick up the materials from the Redemption Centers, bale them into exportable bales, fill shipping containers with the bales, and must sell them to overseas recycling markets within six months.



Crushers at Koror State



Crushers at BGSC

Glass

Glass bottles are collected at KSG Redemption Center where they are separated by color, and manually crushed into glass 'cullet'. The bottles of two beer brands, the most common ones, are provided to the melting machine as base colors for glass products. Other colored glasses are crushed into powder form and mixed with the base colors to adjust colors. Eight local glass artists trained through a JICA grass-roots project produce hand crafted glass products such as ornaments, cups, and drinking glasses. All Processing is done at the Glass Recycling Studio, which started experimenting from 2014, and launched officially in September 2021. The Studio is adjacent to the KSG Redemption Center. The end products have been sold to visitors, and given to representatives from overseas as gifts, and it is expected they will be sold in Koror town at tourist shops.



Clear (Corona) and green glass (Heineken) are the most consumed and the base colors.



Koror State Glass Recycling Studio



Tetra Pack

Beverage containers made of tetra pack can be returned to both KSG and BGSC, shredded and disposed of at the national landfill with no tipping fee. In general, tetra pack papers are hard to recycled due to these products being composites of a variety of materials.

Table 25 The End of Use Product Management through Palau CDS

Material Types	Collection		Processing/ Domestic Recycling		Export
	KSG	BGS C	KSG	BGSC	
Metals	○	○	Baled	Baled	Palau Waste Collection Company Exported to Taiwan
Plastics	○	○	Baled	Baled	Exported to Taiwan
Glass	○	×	Repurposed to Glass Crafts		
Tetra Pack	○	○	Shredded and disposed of at landfill	Shredded and disposed of at landfill	

Lessons Learnt

■ ***The Two Redemption Center Operators***

In Palau, legislation allows businesses to operate Redemption Centers, where certain conditions are fulfilled. As of writing, there are two Redemption Centers in the same area: Koror State Government (KSG) has run a Redemption Center since the beginning of the CDS program, whilst five years later Belau Garbage & Scrap Co. (BGSC) was approved as another Redemption Center. As shown in the following table 26, recently 70 - 80 percent of redemption takes place at the Redemption Center run by BGSC. The entire redemption rate in the country has slightly increased since the BGSC's Redemption

Center started (table 27), while the fall in collected materials at KSG has made it difficult to maintain their long-term recycling initiative as planned.

Table 26 Redemption Rate at each Redemption Center in Palau

FY2020	KSG Redemption Center (%)	BGSC Redemption Center (%)
Oct-19	16.69	72.12
Nov-19	8.17	70.16
Dec-19	10.50	56.96
Jan-20	12.72	72.87
Feb-20	11.72	78.38
Mar-20	10.71	64.67
Apr-20	10.33	62.07
May-20	15.44	82.04
Jun-20	14.68	74.63
July-20	14.66	82.65
Aug-20	14.64	72.80
Sep-20	15.59	79.53

Table 27 Redemption Rate of Palau CDS (FY2011 to FY2020)

FY	No. of DBC Import (A)	No. of DBC Redeemed (B)	Redemption Rate (%)
2011	6,663,590	0	0.00%
2012	14,386,027	18,925,157	131.55%
2013	15,459,266	15,369,174	99.42%
2014	15,618,616	14,678,332	93.98%
Total (2011-2014)	52,127,499	48,972,663	93.95%
2015	17,687,328	13,694,907	77.43%
2016	18,554,552	14,491,490	78.10%
2017	17,379,362	15,067,830	86.70%
2018	17,620,492	15,918,424	90.34%
2019	17,090,965	14,952,013	87.48%
2020	16,832,711	14,197,259	84.34%
Grand Total (2011-2020)	157,292,909	137,294,586	87.29%

(Source: Beverage Container Recycling Program Annual Report FY-2020, Republic of Palau Division of Solid Waste Management Bureau of Public Works, MPIIC)

■ **Local Capacity Development for Monitoring**

In order to assess effectiveness of the recycling program and adjust to socioeconomic changes as time goes on, Palau took measures to strengthen the reporting capacity. At the time the program started, there were no officials appointed for the program. Palau made a decision to delay the commencement until an officer was appointed and well trained to oversee the program, including the data monitoring. After the recruitment and training of that officer, the data required for monitoring was determined, and a template of the annual report and operation manual were developed with technical assistance from J-PRISM Phase I. Then the institutional arrangements for data reporting were made with the key

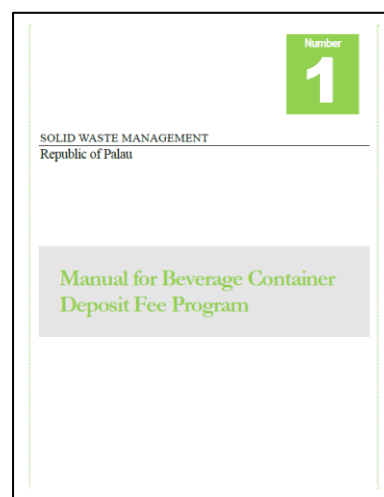
agencies involved, as shown below. Such arrangements enable the Government to identify key parameters such as the redemption rate, the recycling (export) amount, and to monitor the income and expenditure of the Fund in timely manner.

Table 28 Reporting Requirements for Palau CDS

DSWM-BPW, MPIIC	Expenditures and balance of recycling fund is recorded. Annual report based on the aggregated data from the agencies.
MOF	Monthly report on: - Balance of the total Fund - Amount of imported beverage containers
Redemption Center Operator KSG BGSC	Monthly report on: - Number of redeemed containers - Compensation from the Fund
Recycling Company Palau Waste Collection Company	Monthly report on: Amount of export items

■ ***Operation Manual Developed by National and Local Government***

It is of note that a feasibility study for setting the deposit value, and designing the overall system, was not conducted by any agency when the Bill was first introduced in 2006 by the Senate Committee on Youth Affairs and Social Welfare. The initial deposit value was set at \$0.15 per container, which was eventually reduced to the current value of \$0.10 as a result of public comments during the development of the legislation. An Operation Manual was developed by the National Government and the Koror State Government, which helped to keep the recycling program simple and clarified the purpose of the program, the responsibilities of concerned agencies, the relevant legislative framework,, details of operations at the Koror State Redemption Center, and tips for CDS introduction elsewhere.



Reference:

Beverage Container Recycling Program Annual Report FY-2020, Republic of Palau Division of Solid Waste Management Bureau of Public Works, MPIIC

(Author: Ms. Mayu Nomura, J-PRISM II)

Case 6

Tuvalu



Population: 11,655 (WB, 2019)]

Background/ History of the Deposit Scheme

The Waste Management Levy Deposit Regulation (WMLDR) came into force in August 2019. It integrates an advanced recycling fee (through a deposit system) for supporting recycling operations, as well as an advanced disposal fees (through a product tax) to support the collection and safe disposal of specific waste streams. The introduction of the regulation is part of the agreement conditions under the EU-Tuvalu Waste Management Project 2016 -2021, with the goal of having sustainable funds to support waste management in the country after the project. The WMLDR 2019 forms the legal basis for sustainable waste management in Tuvalu with the plan to gradually include more waste streams in the future either through the deposit system for recycling purposes, or as tax for waste collection and disposal purposes.

There are 14 categories of goods and products listed in Schedule 1 of the WMLDR 2019, with 12 to go through the deposit system (i.e. Beverage containers, white goods, heavy machineries and lead and acid batteries) and 2 under the taxation scheme (i.e. Waste oil and nappies). The–Waste Management Levy Committee provides advice to the responsible Minister on items to be enforced from time to time, including new goods to be added in the future if needed. The committee meets on a monthly basis to discuss matters pertaining to the enforcement and implementation of the WMLDR 2019. The committee is chaired by the Permanent Secretary of the Ministry of Local Affairs and Agriculture and consists of these stakeholders - Department of Waste Management, Department of Customs, Department of Treasury, Department of Environment, Department of Marine, Department of Trade, Department of Fisheries, Department of Public Health, Department of Climate Change, Department of Energy, Department of Inland Revenue, Department of Businesses, Price Control Unit, Kaupule, and the Tuvalu National Private Sector Organization.

The first goods that were enforced in August 2019 were the beverages packed in PET bottles and aluminum cans as well as lead-acid batteries. After the 6-month period of deposits collection, the redemption of aluminum cans and PET bottles was opened to the public in February 2020. In April 2020, nappies, vehicles and motorbikes were also enforced, but the redemption is yet to be announced for vehicles and motorbikes. These are durable goods and thus take a longer time before they become waste. Nappies on the other hand is covered under the tax part of the system along with oil for supporting the management of nappies and waste oil. Nappies have been collected separately since 2015 and about 20,000L of waste oil are collected on an annual basis and shipped to Fiji under a partnership with the Pacific Energy Limited.

The recycling programme supported by the deposit system in accordance with the WMLDR 2019 was intended to be operated by a Private Operator. However, the capacity of the local businesses and

companies is limited to ensure the sustainability of the system in the long run. For this reason, the government through the Department of Waste Management has been operating the system since 2019 until a Private Operator is secured in the future. The process for Tuvalu to become a member of the Basel Convention is progressing and will improve the readiness of Tuvalu for the full operation of the system in regard to the shipment of waste to overseas markets beyond the Pacific region.

Table 29 Tuvalu Redemption Rate 2020

		Number of Items		Redemption Rate (%) *1	Recycling Rate (%)
		(/y)	(/y/person) *2		
Aluminum cans	Refunded	523,914	44.9	116	N/A
	Deposited	449,000	-		
PET bottles	Refunded	67,732	5.8	11.6	N/A
	Deposited	580,000	-		
Total	Refunded	591,646		57.50	
	Deposited	1,029,000			

Source: Summary of Collected Items Through the Waste Levy Deposit (The original data obtained from Tuvalu Gov.)

(*1) The data was calculated by the formula: $100 \times (\text{no. of items refunded} / \text{no. of items deposited})$

(*2) was calculated from the number of redeemed materials in 2020 with the population of 2019.

Table 30 Tuvalu Redemption Rate 2021

		Number of Items		Redemption Rate (%) *1	Recycling Rate (%)
		(/y)	(/y/person) *2		
Aluminum cans	Refunded	671,271	57.5	147	N/A
	Deposited	455,000	-		
PET bottles	Refunded	28,099	2.4	4.7	N/A
	Deposited	590,000	-		
Total	Refunded	699,370		66.93	
	Deposited	1,045,000			

Source: Summary of Collected Items Through the Waste Levy Deposit (The original data obtained from Tuvalu Gov.)

(*1) The data was calculated by the formula: $100 \times (\text{no. of items refunded} / \text{no. of items deposited})$

(*2) was calculated from the number of redeemed materials in 2021 with the population of 2019.

Geography, Industry and Logistics

Tuvalu is an atoll group of eight islands widely dispersed, with the government operated interisland shipping services providing the only transportation means. Only Vaitupu has a port that can be approached by interisland ferries. The other outer islands require small boats to transport passengers and their loads to the ships. The main port at Funafuti is only visited by the Southern Pearl Vessel every three weeks, travelling the Fiji-Wallis-Funafuti-Tarawa-FSM-Fiji route, which takes about 20 days. On an annual basis, there are about 18 ship visits to Tuvalu. Funafuti is the main commercial and administrative center and has about 5 small supermarkets and shops. These supermarkets, along with

two specialized liquor importers, are the main importers and local distributors of consumable and durable goods. Locally produced goods are confined to bakery products like bread. The private sector is small with supermarkets and shops as the main business activities.



Source: University of Texas Libraries



Tuvalu Waster Materials Transfer Facility (MRF)



Tuvalu International port

Overview

1. Legal Framework

Waste Management (Levy Deposit) Regulation 2019 came into effect on the 1st August 2019 with the enforcement of only 3 out of 14 categories of goods and products to be levied deposit under the regulation, being PET bottles, aluminium cans, and lead-acid batteries. The second enforcement was on April 2020 which adds three items (nappies, vehicles and motorbikes) to the target goods and products.

- Waste Management Act 2017
- Waste Management (Levy Deposit) Regulation 2019

2. Fund

A Consolidated Public Fund

*A proposed ring-fenced Special Fund was not recommended by Treasury at the commencement of the system, but willing to reconsider their position in the future based on any lessons learnt during the early operation stage of the system. Potential improvements will look at the diversion of deposits for recycling purposes to a Special Recycling Fund, while taxed goods like oil and nappies to remain as it is, as cost recovery means to current ongoing government expenses in supporting waste collection and disposal services, which is now more than AU\$500,000 per year.

3. Agencies

Table 31 Agencies Involved for Tuvalu CDS

Agencies	Roles
The Department of Waste Management of the Ministry of Home Affairs and Rural Development (Department of Waste Management)	One of the regulatory agencies of the programme. Have the mandate to manage the operational side of the system. They oversee and monitor the entire system, conduct public awareness and trainings for workers employed by the Private Operator.
The Treasury Department of the Ministry of Finance	One of the regulatory agencies of the programme. Have the mandate to manage the financial side of the system.
Custom	Collect payments from the importers at the port of entry.
Waste Management Levy Committee	Monitor the progress of the system on a monthly basis and provide advice to the Minister on all matters pertaining to this regulation.
Private Operator (As of 2021, there is no private operator. The Department of Waste Management take this role)	Operate the system under the contract with The Department of Waste Management of the Ministry of Home Affairs and Rural Development.
Producers (importers)	Pay the deposits or levies on the target items that they produced/ imported in accordance with the HS number in the national Custom Tariff. Importers provide the required information to the Custom.
Consumers	Recover the target items to the 'Transfer Station' in a designated manner. Submit the docket to the Department of Waste Management for payment claim.

4. Deposit Rate/ Refund Rate/ Handling Fee

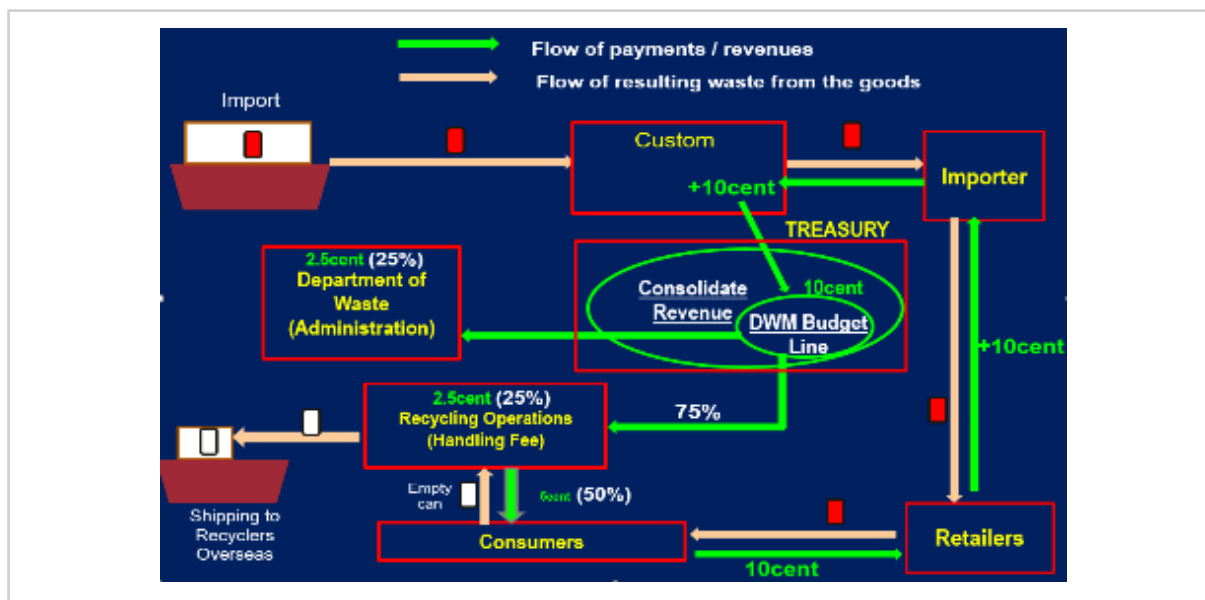
Table 32 Deposits, Refunds, Handling Fee (Tuvalu)

No.	Target Items	Deposit (USD)	Refund (USD)	Handling Fee (USD)
1(*1)	Mineral water, sweetened drinks and cooking oils come in PET bottles	\$0.10 /unit	\$0.05 /unit	\$0.05 /unit

2(*1)	Sweetened drinks and alcohols come in aluminum cans	\$0.10 /unit	\$0.05 /unit	\$0.05 /unit
3	Sweetened drinks, alcohols and cooking oil come in glass bottles	\$0.10 /unit	\$0.05 /unit	\$0.05 /unit
4	Lubricating Oil	\$0.04 /Litre (*3) Note that this is a taxation, not DEPOSIT	No refund	For waste disposal purpose
5(*2)	Nappy	\$0.05 /nappy (*3) Note that this is a taxation, not DEPOSIT	No refund	For waste disposal purpose
	*3: The 100% of the deposit on lubricating oil and nappy support the ongoing collection and disposal operation costs for these items by the government. There is a separate collection and disposal for nappies under the provided collection services. Waste oil has also been collected and shipped to Fiji with about 20,000L on an annual basis.			
6	Large White Goods (2m ³ + size) – Refrigerators, washing machines, electric ovens, etc.	\$100 / white good	\$50 / white good	\$50 / white good
7	Medium White Goods (1m ³ -2m ³ sizes) of the same goods above	\$60 / white good	\$30 / white good	\$30 / white good
8	Medium White Goods (1m ³ -2m ³ sizes) of the same goods above	\$30 /white good	\$15 / white good	\$15 / white good
9	Construction Heavy Equipment – Excavator, loader, trucks (more than 10 tonnes).	\$2,000 / equipment	\$1,000 / equipment	\$1,000 / equipment
10	Construction Heavy Equipment between 5 tonnes and 10 tonnes.	\$1,000 / equipment	\$500 / equipment	\$500 / equipment
11	Construction Heavy Equipment below 5 tonnes)	\$500 / equipment	\$250 /equipment	\$250 /equipment
12(*2)	Office and family vehicles	\$400 /car	\$200 /car	\$200 /car
13(*2)	Motorbikes	\$200 / motorbike	\$100 /motorbike	\$100 /motorbike
14(*1)	Lead Acid Batteries	\$10 /unit (motorbike) \$30 /unit (vehicle) \$60 /unit (solar panel)	\$5 /unit (motorbike) \$15 /unit (vehicle) \$30 /unit (solar panel)	\$5 /unit (motorbike) \$15 /unit (vehicle) \$30 /unit (solar panel)
Conditions				
(*1) August 2019: Item no.1, 2, and 14 are enforced for deposit.				

(*2) April 2020: Item no. 5, 12, and 13 are also enforced for deposit.
 Minimum number of aluminum cans and PET bottles for refund is 20.
 All cans and PET bottles MUST be in clean conditions.
 All cans and PET bottles MUST not be flattened or compressed.

5. Flow/ Management of Money and Goods



<<Deposit Payment (Point of Levy)>>

Under Part III (15) of the regulation, importers are obligated to pay the deposits/ levy and specify clearly the quantities of the goods covered under the regulation. Importers must follow the usual custom clearance process by filling the custom documents and providing the required supporting documents. The submitted information will provide details on the following aspects which are necessary for the purposes of the levy deposit regulation.

- Description of the Goods: E.g. Coca Cola Soft Drink 355ml
- Commodity Code or HS Tariff Code: 22021090
- Quantity of the Goods: E.g. 24 cans x 50 CTN
- Unit of Measure. Litre

The Custom Office assesses the submitted Custom Declaration Forms and other supporting documents. The Commercial invoice and Packing List as supporting documents needed by Customs confirm the details on the imported goods and quantities (counts), which are necessary for determining the amounts of levy deposit to be paid by the importers. An invoice shall be issued to the importers for payment of the estimated waste levies.

- E.g. Based on the example above at (1).
- = 24 cans per Carton x 50 Cartons = 1,200 cans
 - = 1,200 cans x 10cent (Levy Deposit Rate for Aluminum cans).
 - = AUD 120 (Waste Levy Deposit to be paid by the Importer to Custom)

Once the payment is made by the Importer to Custom, a receipt shall be provided for the releasing of the levied goods. Customs enters the information in the system:

Using the example above:

- Description of the Good: Coca Cola Soft Drink 355 ml
- Tariff Code: 22021090
- Quantity: 1,200
- Amount Paid for the Goods: AUD 120
- Account Information: Provided by Treasury

<<Refund Payment (Point of item collection and redemption)>>

There are 13 regulated official collection centers and points:

- 1 Waste Materials Transfer Station as the main central processing facility in Funafuti.
- 5 Community Collection Points in Funafuti.
- 7 Outer islands collection centers for Vaitupu, Nanumea, Nanumaga, Niutao, Nukufetau, Nukulaelae and Nui.

Only the Waste Materials Transfer Station in Funafuti is currently in full operational. The 5 collection points in Funafuti and the centers in the outer islands are yet to be activated pending a review of the first two years of the program implementation.

The regulated official operation hours for the Waste Materials Transfer Station are:

- Last week of every month (Monday – Friday, 9am to 4pm).

N.B. The opening schedule is based on the expected monthly waste materials flow from the targeted goods based on customs information. This is a measure to reduce operational costs with some flexibility for additional days if needed.

An official docket is used after the hand counting process to record the names of the waste items, the confirmed quantities received and the names of the clients or owners. The filled dockets are presented to the DWM Office for payments processing. Advanced arrangements are made by the Treasury Office and DWM for the release of funds for these payments.

<<Fund Management>>

All the payments collected by the Customs are paid to the Treasury Department. This is recorded under a created Budget Line of the Department of Waste Management for regular monitoring and reporting requirements of the regulation. Statements of the received items and levies are produced regularly and reported during the Committee monthly meetings. The full amounts of the levies and deposits are paid to the same way for refunding purposes, supporting of the Transfer Station operation and the management and administration of the system. All the payments are made to the Department of Waste Management for the processing of refunds based on the received documents confirming the received items at the Transfer Station. In addition, there are the operating costs of the Transfer Station in terms of electricity, water, staff and workers, equipment purchase and maintenance, etc. It is one of the reasons why Treasury was reluctant to create a Special Fund at the time of negotiation. Treasury feels that the level of import goods may not generate the sustainable funds to run the system and Treasury

may need to respond and provide the needed support to keep the system operating under the current setup with the Department of Waste Management operating the system. The system may be reconsidered once a Private Operator is available to operate the system, which is difficult to secure in Tuvalu. The government audit agency will conduct a full audit of the system as per government requirements on all government programmes and projects under all government agencies.

6. The End of Use Product Management

Without an interested business, the Department has to play the following designated roles as System Operator; open the Transfer Station, count redeemed items, pay out refunds to the public, sort items by materials, clean items if necessary, bale containers, load in the shipping containers, and keep records of the export amount for monitoring purpose.

The single Materials Recovery Facility (MRF) at Funafuti, a warehouse of 200m² and stockpiling volume capacity of 2000m³ provide enough space for the expected monthly and annual waste flow from the targeted goods. The surrounding leveled area provides additional space for empty containers as additional storage space if needed. Smaller MRFs will be constructed in the outer islands in collaboration with a number of development partners including the PacWaste Plus to process recovered waste before shipment to Funafuti to reduce volume and shipment costs.

The current redeemed aluminum cans are baled at the MRF into small size blocks of 318mm x 318mm dimensions using the small aluminum balers. With the electricity supply limitations in Tuvalu, the use of a single-phase baler is highly recommended especially in the outer islands. There is also an option for a diesel operated higher baler to improve the baling process. With the current monthly quantities of redeemed cans ranging from 30,000 to 60,000, It is expected that the facility will produce 1 to 2 full containers (20ft) of baled cans on an annual basis. The use of a higher density baler will reduce the freight costs by reducing two containers to one. With the recent improvement and upgrading of the electricity supplies at the MRF, such a higher density baler, which can bale metals and plastics, will be installed in the future.

At present, the redeemed PET bottles are stockpiled and stored in large bags within the compound while waiting for a potential overseas market. All effort will be taken to export PET bottles under the Moana Taka Scheme, even if no profit is earned to reduce the flow of PET waste to the limited waste disposal facilities.

Vehicles, motorbikes, white goods and heavy equipment when redeemed in the future will be dismantled within the compound using a special excavator with appropriate attachments and special metal cutters and tools. The recovered metals will be cut into small sizes and packed in the containers for off island recycling. The rest of the components like plastic, glass, and textiles components will be disposed of at the waste disposal sites. There are expected hazardous substances from vehicles and white goods, which will be safely removed and stockpiled for proper disposal overseas if needed. The expected material flow from vehicles, motorbikes, white goods and heavy equipment are not much and can be handled at the available facilities with some improvements to be made.



Reference:

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(Authors: Mr. Walter Kaua Pulogo, Tuvalu and Mr. Faafetai Sagapolutele Uitime, J-PRISM II; Editor: Mayu Nomura, J-PRISM II)

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