Desktop studies on principles of waste management and funding mechanisms in relation to the Commonwealth Litter Programme (CLiP)

Vanuatu and Solomon Islands

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Executive Summary

Integrated waste management is an integral part of sustainable development. The principles of precaution, inter- and intra-generational equity, conservation of biological diversity and ecological integrity, as well as the principle of sustainable consumption and production, will all assist countries in meeting a number of Sustainable Development Goals (SDGs) when applied to waste management. In particular, SDG 12 (responsible consumption and production) includes targets that call for environmentally sound management of all waste through prevention, reduction, recycling and reuse (see targets 12.4 and 12.5).

A common approach to achieving these principles with regards waste management is the application of the 1) polluter pays principle and 2) the extended producer responsibility principle, coupled with the implementation of 3) best practices. Together, these help to build a framework of 4) integrated waste management.

This research provides examples of each of these four approaches to waste management, with discussion on their potential for application in the Pacific region. The focus of the research is to provide options for consideration to overcome two major obstacles in achieving integrated waste management in the region. These are a) **funding** of waste management, including collection, storage, recycling and export, and b) the **transport** of waste products to collection points and recycling centres. The examples selected are presented as options for consideration specifically within Solomon Islands and Vanuatu with application within other Pacific Island Countries (PICs).

The polluter pays principle holds the producer responsible for the cost of collection and recycling. The principle of Extended Producer Responsibility (EPR) places the same responsibility on the producer, but also requires products to be designed in order to reduce harm to humans and the environment throughout the product's lifecycle. Integrated waste management should include the duty of producers to **design** their products for the environment and for recycling, but producers must also be held responsible for incrementally **reducing the waste generated** by the production and use of their products.

Solomon Islands and Vanuatu are party to a number of international and regional instruments. These provide for the inclusion of the above principles in national policy. In addition, national policy of both Solomon Islands and Vanuatu set the legal basis for implementing national funding mechanisms to address waste management. Examples of such mechanisms are provided for consideration with application to the waste streams that are problematic in the two countries. However, the principles and funding mechanisms presented can be applied across multiple waste streams.

Integrated waste management

In Solomon Islands and Vanuatu, both previous studies, as well as those carried out as part of the Commonwealth Litter Programme (CLiP), identified the need to divert **organic waste** from landfill. The examples provided of South Korea and Wales in the United Kingdom outline the policies that divert such waste to composting operations. Providing an alternative disposal

mechanism is important in the Pacific Islands, where pre-paid garbage bags are being implemented. The same applies to the need to collect recyclables separately. Providing separate collection options for organic waste and recyclables reduces the amount of waste being disposed of in pre-paid garbage bags and therefore the cost of such bags to the consumer.

The examples of Australia and Canada provide further options for **national waste policies**, focusing on the role producers can play through Extended Producer Responsibility and Product Stewardship programs. The Canadian example also illustrates integration of **remote communities** within waste strategies. Such considerations are important in the Pacific region where many communities outside of the main urban areas and on islands have no waste collection services due to the cost of providing the required infrastructure and limited transport options.

Funding of collection and recycling

Funding of waste management in Solomon Islands and Vanuatu predominantly falls to the public sector. The polluter pays principle aims to make the producer responsible for the costs of collection and recycling of the products they place on the market. These costs can be transferred to the user. **Foreign visitor fees** have been implemented in some PICs. In Palau, these fees are split across five different national funds. A visitor levy presents a simple option for funding waste management. Such a levy is under consideration in Vanuatu, but it is unclear what portion may be dedicated to improving waste management.

Producers can be held financially responsible for collection costs through **licensing schemes.** The example provided is the Green Dot scheme in Germany that allows a logo to be displayed on packaging for those producers that have paid into a scheme which then funds the collection of the financed items. Such a licensing scheme would provide another option in the Pacific region that would be relatively easy to implement and manage.

The **user-pays** principle holds the consumer responsible for the costs of collection and recycling. In the example of Switzerland, these costs are transferred to the user through the purchase price, whereas in Japan, users must purchase a docket at the time of disposal that covers the cost of collection as well as the cost of recycling the product at end of life. Because of the socio-economic conditions in most PICs it is unlikely that holding the consumer responsible for the full costs of collection and recycling is feasible. This may lead to illegal dumping. However, it may be possible to transfer a small portion of these costs to the consumer within the purchase price of some products.

The examples of Taiwan and Chile illustrate implementation of extended producer responsibility schemes which both place financial responsibility on the producer for the collection and recycling of their products, but include the duty to **design their products** so as to reduce the generation of waste and harm to the environment. In Taiwan, the fee paid by producers is deposited in a government-administered and operated fund that is dedicated to improving recycling. In Chile, the fees are paid into an **industry-managed scheme** which manages the collection and recycling programs on behalf of the industry members. In contrast, the industry-led Australian Packaging Covenant is an **agreement between industry**

and government that sets design and recycling targets, requiring industry members from the packaging supply chain to support material recovery systems in collaboration with government.

Collection costs are charged to the distributors of lead-acid batteries in British Columbia, Canada. This fee is not passed on to the customer, but can be reclaimed by the distributor when returning the battery to the producer. Retailers provide a free collection point. This establishes a **reverse distribution** collection system and would be an option worth considering in most PICs.

Collection and recycling costs can also be **voluntarily funded by industry**. In Australia, the manufacturers of mobile phone handsets and the mobile network carriers jointly and voluntarily fund a program to collect and recycle mobile devices. This product stewardship program has been accredited under the national Product Stewardship Act. Mobile phones are increasingly used in PICs and present a hazard if not disposed of appropriately. It may be possible to encourage voluntary participation of the mobile phone industry in combination with a low fee user-pays scheme. However, a co-regulatory EPR scheme is more likely to have success.

Transport

The challenges of transporting waste can be reduced by 1) reducing the need to transport waste, 2) reducing the cost of transport, and 3) rethinking the traditional waste collection model. Such strategies would reduce the need to expand existing transport models, which in turn increase the reliance on imported diesel and the cost of fleet maintenance.

Where waste can be used in-situ for other uses, such as building material, that waste will not need to be transported out of the area. In addition, the need to transport raw materials into the area will be reduced. An example of **in-situ use of waste** is the stuffing of used plastic bottles with used packaging to create building bricks for walls and houses. In remote areas of PICs, both these types of waste are burned or dumped. Finding alternate options for repurposing such waste would be an interim solution while funding mechanisms are developed for remote transport of waste or programs to reduce the generation of waste.

Backloading provides a form of cheap transport of freight by linking truck drivers returning to base with empty trucks to those wishing to move freight. The use of an online application to facilitate this process has allowed truck drivers to increase their income. Such a system could benefit transport operators in PICs and provide a mechanism to transport clean, sorted waste from remote areas via delivery trucks and ferries.

The traditional method of providing waste collection services is through scheduled kerbside pickups provided by local councils. In Indonesia, a phone application puts small waste collectors, including waste pickers, in direct contact with recycling facilities. Once enough waste is aggregated, the recycler collects the waste, thereby creating an **on-demand waste collection** model. This has increased the earnings of waste collectors while increasing the amount of waste collected and recycled. Such a system may be applicable in the peri-urban areas where waste collection does not exist but where mobile phones are more common.

Inter-ministerial cooperation

Key to the success of any integrated waste management strategy is inter-ministerial cooperation. Vanuatu has established a national waste committee and Solomon Islands has listed such a committee as a goal. The example of the Marine Debris Coordinating Committee in the United States provides an option for ensuring the long-term sustainability and effectiveness of these committees. Legislating the existence of the committee, the ministries that must attend meetings and the reporting obligations of the waste committees would provide a solid foundation for integrated waste management in all PICs.

The legislative and policy frameworks in both Solomon Islands and Vanuatu set the legal basis for implementation of polluter pays and extended producer responsibility schemes, as well as adoption of best practices with regards to waste management. Implementation requires transparency in the calculation of costs for collection, transport and recycling of waste as well as the administration of government- or industry-managed funds. Where levies are applied to the import of products, Customs authorities may need to adopt new processes to collect fees and submit these to the relevant funds.

Vanuatu has recently ratified the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal. This will provide access to international end-markets for recyclable waste materials that are currently not recycled domestically or within the region. Regional recycling options are being investigated by the Pacific Region Infrastructure Facility,[1] as well as decentralised small-scale technology to assist in remote areas.

It is important that the Pacific region move towards long-term funding mechanisms to incentivise industry and consumer behaviour that strengthens collection, handling and transport processes. This, in turn, will provide the environment sought by producers and recyclers to provide locally appropriate solutions that protect the environment and human health throughout the lifecycle of the product.

[1] https://www.theprif.org/

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1. Introduction

The Commonwealth Litter Programme (CLiP) is led by the United Kingdom through the Centre for Environment, Fisheries and Aquaculture Science (Cefas). Funded by the Department for Environment, Food and Rural Affairs (Defra), the programme aims to support five developing countries across the Commonwealth to take meaningful action towards the prevention of plastics entering the oceans.[2] This study contributes to the CLiP goal within Solomon Islands and Vanuatu in the Pacific region by reviewing the national legislation and policy framework of both countries in the context of integrated waste management and providing international examples that could assist in strengthening the domestic frameworks. In addition, international examples of Polluter Pays programmes, best practices and Extended Producer Responsibility schemes are reviewed in the context of Pacific Island Countries (PICs).

Integrated waste management is an integral part of sustainable development. A reduction of 15 to 20% of worldwide Green House Gas (GHG) emissions could be achieved through sustainable waste management.[3] The benefits of ecologically sustainable waste management extend beyond the environmental benefits to include pollution reduction, improved public health, participation of industry stakeholders, including the informal sector, and a range of economic opportunities from green jobs to resource efficiency.

In addition, the integration of principles into waste management strategies, such as the principles of precaution, inter- and intra-generational equity, conservation of biological diversity and ecological integrity, and the principle of sustainable consumption and production will all assist countries in meeting a number of Sustainable Development Goals (SDGs).[4] In particular, SDG 12 (responsible consumption and production) includes targets that call for environmentally sound management of all waste through prevention, reduction, recycling and reuse (see targets 12.4 and 12.5).

A common approach to achieving these principles with regards waste management is the application of the polluter pays principle, whereby the external environmental costs are internalized throughout the lifecycle of products and activities. This is echoed in the preamble of the Stockholm Convention:

> *Reaffirming Principle 16 of the Rio Declaration on Environment and Development which states that national authorities should endeavour to promote the internalization of environmental costs and the use of economic instruments, taking into account the approach that the polluter should, in principle, bear the cost of pollution, with due regard to the public interest and without distorting international trade and investment.*

[2] https://www.cefas.co.uk/clip/
[3] UNEP/ISWA, *Global Waste Management Outlook* (United Nations Environment Programme, 2015)
[4] See https://www.un.org/sustainabledevelopment/sustainable-development-goals

An extension of the polluter pays principle is the principle of extended producer responsibility (EPR). This principle aims to not only internalize environmental costs, but also incentivize changes in product design with the aim of preventing harm and thereby reducing the need to internalize such costs. Social impacts and outcomes should be a strong feature of EPR programmes[5]. A holistic waste management strategy should therefore aim to reduce harm by applying the waste hierarchy (Reduce, Redesign, Refuse, Reuse, Recycle and Recover) through legislation, policies and best practices that reduce the generation of waste, incentivize design for environment and fairly engage all stakeholders in the solutions, thus employing the principle of extended stakeholder responsibility.

The studies presented in this report are based on findings from previous studies conducted in the Pacific region that included Solomon Islands and Vanuatu.

The primary documents, studies and projects that formed the foundation of this report are:

1. Solomon Islands: Solid Waste Management and Pollution Control Strategy 2017 – 2026,[6]
2. Vanuatu: National Waste Management and Pollution Control Strategy and Implementation Plan 2016 – 2020,[7]
3. Pacific Region Infrastructure Facility (PRIF)- Vanuatu country profile,[8]
4. Pacific Region Infrastructure Facility (PRIF) – Solomon Islands country profile,[9]
5. Solid Waste Management in the Pacific. Solomon Islands Country Snapshot,[10]
6. Solid Waste Management in the Pacific. Vanuatu Country Snapshot,[11]
7. The Japanese Technical Cooperation Project for Promotion of Regional Initiative on Solid Waste Management (J-PRISM I & II),[12]
8. PacWaste program[13]
    a. PacWaste Country Profile - Solomon Islands,[14]
    b. PacWaste Country Profile – Vanuatu,[15]
9. Japan International Cooperation Agency (JICA) in Oceania,[16]
10. Luganville Waste Characterisation Report,[17] and

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[5] OECD, *Extended Producer Responsibility: Updated Guidance for Efficient Waste Management* (OECD Publishing, 2016)
[6] SPREP, *Solomon Islands : Waste Management and Pollution Control Strategy 2017-2026* (2017)
[7] Government of Vanuatu - Department of Environmental Protection and Conservation (DEPC), *National Waste Management and Pollution Control Strategy and Implementation Plan 2016-2020* (2016)
[8] Pacific Region Infrastructure Facility (PRIF), *Pacific Region: Solid Waste Management and Recycling - Pacific Country Profiles* (2018)
[9] Ibid
[10] Asian Development Bank (ADB), *Solid Waste Management in the Pacific - Solomon Islands Country Snapshot* (2014)
[11] Asian Development Bank (ADB), *Solid Waste Management in the Pacific - Vanuatu Country Snapshot* (2014)
[12] See https://www.sprep.org/j-prism
[13] See https://www.sprep.org/pacwaste
[14] See https://www.sprep.org/pacwaste/resources/country-profiles
[15] See https://www.sprep.org/pacwaste/resources/country-profiles
[16] See https://www.jica.go.jp/english/countries/oceania/index.html
[17] Mary O'Reilly & Luganville Municipality, *Luganville Waste Characterisation Report* (2013)

11. Review of Regional E-Waste Recycling Including a Model Product Stewardship Approach for Pacific Island Nations.[18]

These previous studies helped focus the research on the waste streams that are problematic in the two countries, as well as the items listed in the national waste strategies of each. However, the principles and funding mechanisms presented can be applied across multiple waste streams and are provided here as examples of mechanisms that can be considered and tailored to the local context. The intention of the report is to find locally-appropriate funding mechanisms that can develop into self-funded waste management services that prioritise the health of the community and the environment.

Used oil is a focus of the National Implementation Plans of the Stockholm Convention, particularly for the prevention of Unintended Persistent Organic Pollutants (uPOPs). This has therefore not specifically been included within the studies of this report. A plan for uPOPs was developed for Vanuatu in 2018.[19] Healthcare waste, asbestos and eWaste were a focus of the PacWaste project. However, eWaste has been included in this study because of the focus placed on this waste stream in the national waste strategies and the strong projected growth in this waste stream.

PRIF investigated the feasibility of regional recycling centres within the Pacific region, establishing a foundation that the South Pacific Regional Environmental Program (SPREP) aims to build on. Similarly, JPRISM II will build on JPRISM I. The suggestions presented in this report may be considered by SPREP and JPRISM II to provide options for long-term funding of the projects they undertake.

The studies presented here aim to address two overarching challenges in waste management within the Pacific context, namely **funding** and **transport**. This is particularly important in both Solomon Islands and Vanuatu where the collection of property taxes is low[20] and other means of generating sustainable funds for collection, transport, handling, recycling and export are limited. Transport relies on imported fuel and care should be taken in waste management strategies to avoid an increase in transport costs that cannot be offset by increased sources of funding. All studies therefore consider the required foundation of sustainable funding mechanisms. Where appropriate, the legislative frameworks that support such funding mechanisms are outlined.

The following approaches to waste management have provided a focus for the examples selected:

1. Reduction in the generation of waste,
2. Waste collection methods (urban and remote),

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[18] Leney, A., *Review of Regional E-Waste Recycling, Including a Model Product Stewardship Approach for Pacific Island Nations* (Pacific Reef Savers Ltd, 2013)

[19] Global Environment Facility–Pacific Alliance for Sustainability (GEF-PAS), *Vanuatu National Action Plan to reduce releases of Unintentional Persistent Organic Pollutants 2018-2022* (2018). See also https://www.sprep.org/gefpaspops/gefpas-reports

[20] Pacific Region Infrastructure Facility (PRIF), above n 8

3. Transport costs through:
    a. Reducing the need for transport (e.g. distributed and in-situ solutions)
    b. Redesigning transport systems (e.g. on-demand vs scheduled, reverse distribution and backloading).

As much as possible, the socio-economic and geographic contexts of Solomon Islands and Vanuatu have been taken into account. However, the overarching intention is to provide a visionary suite of implementation options that will help achieve the documented national goals of waste management. This is not without recognition of the obstacles present in both countries. The intention is to contribute to Steps II and V of a possible 5-stepped long-term approach:

Step I: Identify the overarching socio-economic and environmental goals.
Step II: Design an integrated vision for achieving these goals.
Step III: Identify the obstacles in reaching the desired vision.
Step IV: Assess options for overcoming these obstacles.
Step V: Fund and implement steps towards the vision.

All studies are desktop studies and seek to outline a selection of practical options for consideration when implementing and achieving the regional and national goals of integrated solid waste management within the Pacific Island Countries context.

Chapter 3 – Integrated Waste Management assesses the overall approach within the Pacific region (specifically for Solomon Islands and Vanuatu) towards the strategic approach of integrated waste management. Because the financing of waste management in the Pacific is a pressing issue, a focus is given to measures agreed to at the international and regional level that promote adoption of the polluter pays principle, best practices and extended producer responsibility schemes. A selection of strategies adopted in different countries are discussed that together provide options for consideration when designing or assessing an integrated approach to national legislation and policy within Solomon Islands and Vanuatu.

Chapter 4 – Polluter Pays Programmes investigates select programmes within and beyond the region that implement various polluter pays or user pays schemes to fund waste management. Each is discussed in the context of the challenges facing the Pacific region, specifically the Solomon Islands and Vanuatu.

Chapter 5 – Best Practices for Imported Used Products highlights practices that are applicable to a region that is very much dependant on imported goods but are challenged by transport costs and lack of infrastructure. The study focusses on methods that can assist in reducing the need to transport waste or change the way waste is transported in order to reduce the burden on the public sector.

Chapter 6 – Extended Producer Responsibility Programmes first clarifies the contribution of EPR schemes to waste management beyond the role of polluter pays programmes. The funding mechanisms behind the schemes adopted under EPR and Product Stewardship

legislations are highlighted. Each is then discussed in the context of the Pacific region, particularly Solomon Islands and Vanuatu.

Beyond the scope of these studies is a thorough assessment of social, economic and environmental costs and benefits of current and suggested strategies and approaches, discussion on monopolies versus competitive systems, or the avoided costs that integrated solid waste management can achieve.

The challenges facing both Solomon Islands and Vanuatu have been taken into account. However, reviews of approaches adopted in other countries internationally are provided to stimulate discussion on possible steps to achieving a long-term and holistic framework to deal with waste in an environmentally sound manner that also satisfies the needs of society as a whole. As this report shows, many of the challenges in funding an integrated waste management strategy are not unique to Solomon Islands and Vanuatu, but to all countries. However, creating a vision of a longer-term framework for environmentally and socially sustainable waste management allows for identification of obstacles and requirements, moving towards a nationally appropriate state of good governance for waste management.

2. Pacific island countries in context

The challenges facing the management of waste in most island states has been well documented.[21] These are acknowledged in the Pacific region and include geographic remoteness, logistical and financial constraints in transporting recovered waste both within the country and for export, as well as the low volumes of recyclable waste generated (particularly eWaste) which limit the economic benefits of scale.

Waste management in the Pacific Island Countries (PICs) ranges from urban systems which may be in a transitional phase with partial and unreliable coverage (particularly within informal settlements) to near non-existent in remote areas. In the rural areas, these services are limited and waste is often dealt with through dumping, burying or open burning. The collection of household recyclables is limited. Commercial incinerators are used at ports for quarantine waste, but the cost of fuel has meant much of this waste is landfilled or burned in open areas.[22] Incineration and open burning of organic and inorganic waste, including used oil, contributes to the release of uPOPs into the environment.[23]

Costs or unavailability of spare parts to repair vehicles and equipment are common and there is often a shortage of expertise to install and maintain equipment. Mobile phones, tablets and Used Lead Acid Batteries (ULAB) waste streams are increasing, the latter used for solar power in remote areas not serviced by national electricity supplies. The increase in solar power servicing households is expected to lead to greater use of electrical items with a resulting increase in this waste stream. In addition, of the nearly 93,000 vessels operating in the region, close to 50,000 are fishing vessels and approximately 9,000 are passenger carriers, each with the potential to contribute to sea-based sources of waste that may ultimately need to be dealt with by island countries.[24]

A key approach has been to export recyclable materials, which has also faced complications in the region. Island states tend to rely on imported products, but have limited economic incentive to collect and recycle most waste streams, partly due to the low value of recyclable items. As a result, most eWaste collected has been stored in shipping containers for years awaiting shipment.[25] The primary waste streams exported are used motor and cooking oils and scrap steel.[26] Export markets for waste generated in Solomon Islands and Vanuatu have been further restricted due to both countries not being party to the Basel Convention. However, both countries are party to the regional Waigani Convention, allowing export of hazardous waste to members of this convention (mostly Australia and New Zealand). As of

[21] See studies conducted in the Pacific listed in Section 1.
[22] Pacific Region Infrastructure Facility (PRIF), above n 8
[23] See https://www.sprep.org/gefpaspops
[24] SPREP, *Pacific Ocean Pollution Prevention Programme (PACPOL) : Strategy and Work Plans 2015-2020* (2015), pg11
[25] Pacific Reef Savers Ltd, *Summary Report to the PacWaste Technical Advisory Panel The Collection: Collation and Review of Data on the Status of E-Waste Management In Pacific Island Countries Including a Cost-Benefit Analysis of Capacity for Electrical and Electronics Goods Recycling, Repair or Refurbishment* (2014)
[26] Pacific Region Infrastructure Facility (PRIF), above n 8

14th January 2019, Vanuatu became a member of the Basel Convention, opening up opportunity for international trade of hazardous and other wastes.

In an effort to combat the growing waste issue, the Pacific region has set a target for 2025 that 75% of waste resources are recovered through recycling, reuse and return. The per capita generation of municipal solid waste is also targeted, coupled with a target of 60% of the national population covered for waste collection.[27] Efforts have been made in this regard, with studies being conducted to characterise waste, predict trends and seek financially sustainable options to collect, handle, store and transport different types of waste.

A 2014 PacWaste project, which built on a 2013 UN-funded Strategic Approach to International Chemicals Management (SAICM) project, provides options and budgetary requirements to develop and encourage recovery of various waste electrical and electronic equipment (WEEE) streams. Both projects included the Solomon Islands and Vanuatu and the suggestions presented will not be repeated here, but can be built on and/or integrated into the broader waste strategies of each country.[28] In all countries assessed, it was evident that ongoing sustainable funding mechanisms needed to be developed once initial costs of collection, handling and export had been demonstrated. In addition, as rural electrification schemes are implemented, use of electronics is likely to increase without parallel enhancements in waste management to deal with these waste streams.

To overcome some of the issues, Vanuatu has implemented a ban on the import of single-use plastic bags and polystyrene takeaway boxes, effective 31 January 2018 with some grace periods.[29] Solomon Islands Western Province has announced intentions for a similar ban on the import of single-use plastic bags, but this has yet to be enacted.

A number of PICs have made progress on the issue of protecting their people and their environment by preventing harm from pollution, including pollution by waste substances. With regards packaging waste, the instruments adopted include:[30]

- Cook Islands
    - Environment Act 2003 - Environment (Mitiaro) Regulations 2008
    - Environment Act 2003 - Environment (Atiu and Takutea) Regulations 2008
    - Environment Act 2003 - Environment Act (Ozone Layer Protection) Regulations 2008 (plastic foam)
- Fiji
    - Environment and Climate Adaptation Levy (Plastic Bags) Regulations 2017 Environmental Levy (Budget Amendment) Act 2017
- Kiribati

[27] SPREP, *Cleaner Pacific 2025: Pacific Regional Waste and Pollution Management Strategy 2016–2025: Implementation Plan* (SPREP, 2016) <http://www.sprep.org/attachments/Publications/WMPC/cleaner-pacific-strategy-imp-plan-2025.pdf>

[28] See studies conducted in the Pacific listed in Section 1.

[29] See https://www.gov.vu/en/public-information/492-prohibition-on-imports-of-plastic-bags

[30] Adapted from SPREP, *Regulating plastics in Pacific Island Countries: a guide for policymakers and legislative drafters* (2018) <https://www.sprep.org/sites/default/files/documents/publications/Plastics%20Digital.pdf>

- The Special Fund (Waste Materials Recovery) Act 2004

- Marshall Islands
  - Styrofoam and Plastic Products Prohibition, and Container Deposit Act 2016
- Niue
  - Environment Act 2003 – Ozone Layer Protection Regulations 2007 (plastic foam)
- Palau
  - RPPL No. 10-14: Plastic Bag Use Reduction
- Samoa
  - Waste (Plastic Ban) Management Regulation 2018
  - Lands, Surveys and Environment Act 1989 – Ozone Layer Protection Regulations 2006 (plastic foam)
- Tonga
  - Waste Management (Plastic Levy) Regulations 2013
  - Ozone Layer Protection Act 2010 - amended by the Ozone Layer Protection (Amendment) Act 2014) (plastic foam)
- Vanuatu
  - Waste Management Act No. 24 of 2014
    - Waste Management Regulations Order No. 15 of 2018
    - Private Waste Operator's Licence Fees Order No. 16 of 2018
    - Waste Management (Penalty Notice) Regulation Order No. 17 of 2018
  - Ozone Layer Protection Act 2010 (plastic foam)

There are also examples in the Pacific of levies charged to foreign visitors:

- Fiji - Service Turnover Tax Decree No.8 Of 2012 (6% Service Turnover Tax (STT) for visitors staying at hotels and resorts).[31] Fiji also applies a 10% Environment & Climate Adaptation Levy on various services.[32]
- Niue - Departure Tax Regulations 2007 ($80 as of 2017).
- Palau - RPPL No.10-02: Pristine Paradise Environmental Fee, as amended by RPPL No. 10-16 (see Chapter 4).

In some PICs, legislation provides for an advance recycling/deposit fee to be charged and/or an environmental fund to be established. These include:[33]

- Cook Islands - Environment Act 2003
- Samoa - Waste Management Act 2010
- Tonga - Waste Management Act 2005

The inclusion of principles within national binding and voluntary instruments may provide the mandate to further investigate the adoption of legislation that holds various stakeholders accountable for their waste. These principles include:

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[31] See https://www.frcs.org.fj/our-services/taxation/business/service-turnover-tax-stt/
[32] See https://www.frcs.org.fj/our-services/taxation/business/environmental-levy/
[33] Unknown, *Review of e-waste Related Activities in the Pacific Islands* (2018) <https://www.sprep.org/attachments/report4-ewaste-baseline-2018.pdf>

- Polluter pays
- Extended producer responsibility
- Extended stakeholder responsibility
- Product stewardship
- Best practice
- Lifecycle assessment

This report investigates the obligations undertaken by Solomon Islands and Vanuatu within international, regional and national instruments. Further detail is provided in the Annexes to this report.

3. INTEGRATED POLICY FOR WASTE MANAGEMENT

3.1. Objective of the study

This study aims to *review and recommend integrated national, regional and international policies with supporting legislation and implementation strategies for waste management, compliant with relevant convention obligations*.

Both Solomon Islands and Vanuatu have begun the transition from managing single waste streams to integrated waste management strategies, combining waste management with waste reduction approaches. This is more evident within urban centres. A number of donor projects have assessed the waste situation in the majority of PICs. Policies have been developed for the implementation of integrated waste management, ranging from waste oils to eWaste, ULABs and uPOPs. Awareness campaigns have been conducted for specific waste streams such as organic waste. However, large gaps remain in the infrastructure required to achieve the goals identified at the regional, national and local levels.

The greatest challenge beyond awareness is providing sustained financing for the required management process. This study therefore places a focus on measures at the international, regional and national levels that support the adoption in both countries of polluter pays schemes (including user pays), best practices and extended producer responsibility programmes (including product stewardship). Adoption of these approaches will greatly assist in achieving integrated waste management in both urban and remote locations. The study further reviews integrated solid waste strategies in other regions that may provide further options for consideration by Solomon Island and Vanuatu authorities.

Practical options for consideration when implementing programmes that adopt the principles of polluter pays, best practices and extended producer responsibility are discussed in greater detail in Chapters 4, 5 and 6 respectively. Together these studies can assist in achieving the goals of the Basel Convention in which the preamble notes:

> *"…the most effective way of protecting human health and the environment from the dangers posed by such wastes is the reduction of their generation to a minimum in terms of quantity and/or hazard potential."*

By incorporating polluter pays schemes, best practices and extended producer responsibility programmes, initiatives can aim to target waste reduction upstream by placing greater responsibility on the importer, manufacturer and retailers of specific waste streams. Such strategies will assist the Pacific region in achieving the specific regional goals of increased waste collection coverage, an improved waste capture rate (amount collected versus amount generated) and a reduced per capita generation of municipal solid waste.[34]

[34] SPREP, above n 27

3.2. Integrating waste management legislation and implementation strategies across the national, regional and international level

Traditional waste management aims to manage the generation, collection and transport, sorting, end-of-life treatment, recovery and disposal of wastes into one management system. Integrated waste management aims to further incorporate the social and political aspects into a single strategic approach that leads to the sustainable management of all wastes from all sectors within a particular boundary.

The integrated waste management approach also seeks to incorporate obligations and practices agreed to in multilateral instruments. A holistic management system is founded on strong regulatory and fiscal policies, technologies appropriate to local socio-economic and geographic situations, as well various public and private sector voluntary measures. Approaches should be guided by waste characterisation and quantification of future trends.

Extended stakeholder responsibility, which includes all parties engaged in consumption and production, is vital to the success of any integrated waste management strategy. The 3R approach and the principles of sustainable materials management (SMM) and sustainable consumption and production (SCP) are thus fundamental to the policies, strategies and practices that aim to reduce the effects of waste on both human and environmental health. In addition, integrated waste management should result in greater resource efficiency, reduced costs of waste management, business opportunities and local participation.

Key to the success of any integrated waste management strategy is a **single government body** to prioritise and coordinate efforts across ministries and other stakeholders. Inter-ministerial coordination must consider waste management in the context of parallel national strategies, such as reduction of greenhouse gas emissions, rural electrification, national health provisioning and, in particular, growth of household income. Stakeholder engagement can facilitate waste exchange programs, creating jobs and enhancing inclusion of local communities. A single body with the mandate to addresses integrated waste management must ensure continuity across elections of political leaders, including mayors, and provide legislative and financial security to investors.

3.3. Obligations of Vanuatu and Solomon Islands under relevant international and regional instruments

In recent decades Pacific Island Countries have been involved in the development of regional and international instruments. A suite of obligations within these instruments is therefore available for national governments to consider. These have implications for changing national legislation, policy and practice at home. Both Vanuatu and Solomon Islands are in this situation. The range of international and regional instruments relevant to this study are presented below.

Table 1: International and regional policy support for implementation of polluter pays principle

Instrument (Binding/ Voluntary)	Includes Polluter Pays principle	Status Solomon Islands	Status Vanuatu
UNCLOS (B)	None	x	x
Basel Convention (B)	**Yes**		x
Stockholm Convention (B)	**Yes**	x	x
CBD (B)	**Yes**	x	x
Honolulu Strategy (V)	**Yes**		
MARPOL Annex V (B)	None	x	x
London Convention (B)	None	x	x
London Protocol (B)	Yes		x
Fish Stocks Agreement (B)	None	x	x
FAO Code of Conduct (V)	**Yes**		
Noumea Convention (B)	None	x	
Pacific Dumping Protocol (B)	None	x	
Waigani Convention (B)	None	x	x
Pacific Regional Waste and Pollution Management Strategy 2016-2025 (V)	**Yes**	x	x
PACPOL 2015-2020 (V)	**Yes**	x	x
Pacific Marine Litter Action Plan 2018 (V)	**Yes**		

Table 2: International and regional policy support for implementation of best practices

Instrument (Binding/Voluntary)	Best practices	Status Solomon Islands	Status Vanuatu
UNCLOS (B)	**Yes**	x	x
Basel Convention (B)	**Yes**		x
Stockholm Convention (B)	**Yes**	x	x
CBD (B)	**Yes**	x	x
Honolulu Strategy (V)	**Yes**		
MARPOL Annex V (B)	**Yes**	x	x
London Convention (B)	**Yes**	x	x
London Protocol (B)	**Yes**		x
Fish Stocks Agreement (B)	None	x	x
FAO Code of Conduct (V)	**Yes**		
Noumea Convention (B)	**Yes**	x	
Pacific Dumping Protocol (B)	None	x	
Waigani Convention (B)	**Yes**	x	x
Pacific Regional Waste and Pollution Management Strategy 2016-2025 (V)	**Yes**		
PACPOL 2015-2020 (V)	**Yes**		

Pacific Marine Litter Action Plan 2018 (V)	**Yes**		

Table 3: International and regional policy support for implementation of extended producer responsibility programmes

Instrument (Binding/Voluntary)	EPR programmes	Status Solomon Islands	Status Vanuatu
UNCLOS (B)	None	x	x
Basel Convention (B)	**Yes**		x
Stockholm Convention (B)	**Yes**	x	x
CBD (B)	None	x	x
Honolulu Strategy (V)	**Yes**		
MARPOL Annex V (B)	None	x	x
London Convention (B)	None	x	x
London Protocol (B)	None		x
Fish Stocks Agreement (B)	None	x	x
FAO Code of Conduct (V)	None		
Noumea Convention (B)	None	x	
Pacific Dumping Protocol (B)	None	x	
Waigani Convention (B)	**Yes**	x	x
Pacific Regional Waste and Pollution Management Strategy 2016-2025 (V)	**Yes**		
PACPOL 2015-2020 (V)	None		
Pacific Marine Litter Action Plan 2018 (V)	**Yes**		

3.4. Review of adoption of the principles within national instruments

The participation in international and regional fora and acceptance of the international instruments developed does not necessarily mean the obligations arising from international instruments have been incorporated into policy at a national level. The use of terminology in national legislation can set the legal basis for adoption of regulations and schemes that enable compliance with international and regional obligations. In this section we look for the occurrence of the terminologies associated with key principles included within national legislation and also identify where it may be inferred.

3.4.1. National adoption of the principles of Polluter Pays, Best Practice and Extended Producer Responsibility

The three principles of Polluter Pays, Best Practice and Extended Producer Responsibility (EPR) are referred to in a number of policy instruments of both Solomon Islands and Vanuatu.

This may be explicit or inferred, but set the legal basis for adoption of schemes as illustrated in this report. A summary of the instruments is provided in this section. Refer to Appendices 4 and 5 for the applicable text within each instrument.

Table 4: Adoption of the principles within national legislation – Solomon Islands.

Principle	Solomon Islands instruments – explicit or inferred adoption
Polluter Pays	Environment Act 1998 National Solid Waste Management and Pollution Control Strategy (2017 – 2026) Maritime Authority Act 2018 Maritime Safety Administration Act 2009 Shipping (Marine Pollution) Regulations 2011 Fisheries Management Act 2015 Ports Act 1990
Best Practice	Environment Act 1998 National Solid Waste Management and Pollution Control Strategy (2017 - 2026) Maritime Safety Administration Act 2009 Shipping (Marine Pollution) Regulations 2011 Fisheries Management Act 2015 Fisheries Management Regulations 2017
EPR	Environment Act 1998 National Solid Waste Management and Pollution Control Strategy (2017 - 2026)

Table 5: Adoption of the principles within national legislation - Vanuatu

Principle	Vanuatu instruments – explicit or inferred adoption
Polluter Pays	Waste Management Act No. 24 of 2014 National Waste Management and Pollution Control Strategy and Implementation plan 2016-2020 Vanuatu National Environment Policy and Implementation Plan 2016–2030 (NEPIP) Used Oil Management Plan 2014
Best Practice	Pollution (Control) Act No. 10 of 2013 Waste Management Act No. 24 of 2014 Vanuatu National Action Plan to reduce releases of Unintentional Persistent Organic Pollutants 2018-2022
EPR	Waste Management Act No. 24 of 2014

Further analysis of the national legislation of Solomon Islands and Vanuatu shows that measures have been adopted which support implementation of various multilateral environmental agreements. Those that have application to the provision of environmentally sound waste management are summarized below, providing further support for the duty to provide these services.

Table 6: National instruments giving effect to international and regional obligations - Solomon Islands

National Instrument	Applicable measures – Solomon Islands	Instrument
Environmental Health Act 1980 rev 1996	Prevention and management of other wastes. Sets duty of authorities to provide bins in public spaces, prevent accumulation of rubbish that promotes breeding of mosquitoes. Restrict dumping of refuse	Basel Convention London Convention (Preamble)

	on beaches or foreshores and prohibit in urban watercourses.	
Environment Act 1998 (sets legal basis for adoption of measures)	6. (1) The functions of the Division shall be to - (a) protect, restore and enhance the quality of the environment of Solomon Islands, having regard to the need to promote sustainable development; (2) For the purposes of promoting sustainable development as envisaged under subsection (1) (a), the Division shall as far as practicable be guided by the following – (c) conservation of biological diversity and ecological integrity;	CBD
Environment Act 1998 (proposed amendments)	Revisions proposed in 2015, 2016 will add two new sections: PART IV-A - WASTE MANAGEMENT 51B. Principles of Waste Management 51C Obligation to Obtain a Licence 51D Illegal Dumping of Waste 51E Penalties for Breach of Section 51D 51F Import and Export of Waste 51G Regulations on Waste Management PART IV-B - CHEMICALS MANAGEMENT 51H Dangerous Substances and Preparations 51I Import and Export of Dangerous Substances and Preparations 51J Persistent Organic Pollutants	*If amendments suggested in 2015, 2016 are adopted, legal basis will be set for*: Basel Convention Waigani Convention Stockholm Convention
Environment Regulation 2008	Reduce generation of wastes through Environmental Impact Assessments for developments	Basel Convention London Convention (Preamble)
Solomon Islands National Waste Management and Pollution Control Strategy 2017-2026	Management of waste and reduction in generation of wastes (hazardous and other)	Basel Convention London Convention (Preamble)
Shipping Act No. 5 of 1998	Prohibits discharge of garbage and dumping of wastes generated on land	MARPOL 73/78 Annex V London C/P
Solomon Islands Maritime Authority Act No. 9 of 2018	Provision of port reception facilities	MARPOL 73/78 Annex V
Shipping (Marine Pollution) Regulations 2011	Prohibits discharge of garbage and dumping or incineration of wastes generated on land	MARPOL 73/78 Annex V London C/P Noumea Convention Pacific Dumping Protocol
Fisheries Management Act (2015)	Protection of species and habitat through prevention of pollution, minimize catch by lost or abandoned gear	Fish Stocks Agreement
Fisheries Management Regulations 2017	Marking of vessels and fishing gear	Code of Conduct for Responsible Fisheries
Ports Act (1996)	Prevent pollution of harbor by refuse	MARPOL 73/78 Annex V

As per the National Waste Management and Pollution Control Strategy 2017-2026, the following are proposed for Solomon Islands:

- Legislation banning the use of all plastic bags is to be in place by 2020 with bio-degradable bags as a replacement.
- National guidelines on the disposal and management of E-wastes with a section regarding the specific component of waste from solar lighting and other sources.
- Pilot projects for the implementation of the following waste thematic policies:
    - The National Health Care Waste Policy; and
    - National Implementation Plan on Persistent Organic Pollutants (POPs).

There appears to be no legislation that regulates the import and export of hazardous or other wastes, as per the Basel Convention and the Waigani Convention. This may be planned once the proposed amendments to the Environment Act are adopted. Tonga's *Hazardous Wastes and Chemicals Act No. 28 of 2010*[35] may serve as an example.

Table 7: National instruments giving effect to international and regional obligations - Vanuatu

National Instrument	Applicable measures	Int'l/Reg'l Instrument
Public Health Act 1994	Reduce release of wastes into watercourses, environment through provision of waste bins in public spaces, prohibit littering on beaches, foreshores, streets	Basel Convention London Convention (Preamble)
Environmental Management and Conservation Act No. 12 of 2002	Provides for regulation of environmental effects of importation and transportation of hazardous substances as well as environmental effects of waste management and air and water pollution	Stockholm Convention Basel Convention
Environmental Management and Conservation Act-Environmental Impact Assessment Regulations Order No. 175 of 2011	Reduce generation of wastes through Environmental Impact Assessments for developments.	Basel Convention London Convention (Preamble) Stockholm Convention
Pollution (Control) Act No. 10 of 2013	Proper management and regulation of discharge of pollution and hazardous substances.	Basel Convention London Convention (Preamble) Stockholm Convention
Waste Management Act No. 24 of 2014	Definition of hazardous wastes, POPs Management of hazardous and other wastes Act of depositing litter or waste includes from ship, boat, vessel or craft.	Basel Convention Waigani Convention Stockholm Convention MARPOL Annex V
Waste Management Regulations Order No. 15 of 2018	Reduce generation of waste – ban on import of plastic bags (except for meat and fish), straws and polystyrene disposable food containers, prohibit littering.	Basel Convention
Vanuatu National Environment Policy and	Promotes incentive schemes that implement the polluter pays principle by encouraging cleaner	Basel Convention

[35] Available at: http://www.basel.int/Portals/4/download.aspx?d=UNEP-CHW-NATLEG-NOTIF-Tonga01-ACT28.English.pdf

Implementation Plan 2016-2030	production and waste recovery. Reduce waste and pollution.	London Convention (Preamble)
National Waste Management and Pollution Control Strategy and Implementation plan 2016-2020	All types of wastes generated are reduced, collected, reused, recycled and treated by environmentally sound technologies suited to local conditions and waste going to landfill is minimized to the lowest possible amount. Promotes polluter pays and product stewardship schemes.	Basel Convention London Convention (Preamble) Stockholm Convention (Preamble)
Vanuatu National Action Plan to reduce releases of Unintentional Persistent Organic Pollutants 2018-2022	Improved waste management, including in the health sector.	Stockholm Convention
Used Oil Management Plan for Vanuatu 2014	Suggests implementation of used oil stewardship program, export of used oil, provides model national legislation	Basel Convention Stockholm Convention
National Sustainable Development Plan 2030	Reduce waste and pollution through effective waste management and pollution control.	Basel Convention London Convention (Preamble)
Maritime (Conventions) Act No. 39 of 2017	The provisions of the Conventions listed in the Schedule and any regulation, guideline or rules made from such Conventions have the force of law in Vanuatu.	MARPOL 73/78
Fisheries Act No. 10 of 2014	Provides for minimizing of waste, catch by lost or abandoned gear, pollution originating from fishing vessels, impacts on associated or dependent species and marking of fishing gear.	Fish Stocks Agreement Code of Conduct for Responsible Fisheries

There appears to be no legislation that regulates the import and export of hazardous or other wastes, as per the Basel Convention and the Waigani Convention. This may be planned once the Basel Convention is acceded to (14 January 2019). Tonga's *Hazardous Wastes and Chemicals Act No. 28 of 2010*[36] may serve as an example.

It has been suggested that the *Environmental Code of Practice for Used Battery Disposal for Rural Electrification Project Vanuatu (2014)* be expanded to include the end-of-life treatment of solar panels.[37]

Other programmes and instruments in place in Vanuatu include:

- POPs and UPOPs are addressed in the Vanuatu National Plan for Implementation (NIP) of the Stockholm Convention on Persistent Organic Pollutants (2011).
- Used Oil Management Plan for Vanuatu (2014).

[36] Available at: http://www.basel.int/Portals/4/download.aspx?d=UNEP-CHW-NATLEG-NOTIF-Tonga01-ACT28.English.pdf

[37] Vanuatu Department of Energy, *Environmental and Social Management Framework for the Vanuatu Rural Electrification Project Stage II (VREP II)* (2016)

- Pre-paid garbage bags system (user pays) have been implemented by Port Vila and Luganville municipal councils for residential and commercial garbage. Garbage must be placed in pre-paid red or yellow bags.[38]
- Nation-wide prohibition on the manufacture, sell, give or otherwise provide single use plastic shopping bags, polystyrene takeaway boxes and plastic straws.
- Waste audits in Port Vila and technical support to improve existing solid waste management systems under JPRISM II project.

3.5. Examples of selected waste management policies

One of the consequences of the Pacific islands being geographically isolated is a limit on the range of information they receive in respect of some of the waste management strategies that take place in other parts of the world. While not all of these are directly translatable to the small island context, there is merit in reviewing developments outside of the Pacific Islands region, as some of these will provide insights for strategic development. This section reviews waste management strategies in a greater global context, while also providing a focus on specific waste management strategies. An example of specific strategies is that of green waste collection for composting. Organic waste remains a large component of the waste profile in PICs and mismanagement can contribute to greenhouse gas emissions, including through the current practice of burning for household cooking purposes.[39]

The examples of waste management policies presented have been selected for their relevance to the Pacific context, while providing a wide array of adopted policies to consider. South Korea has focused on the reduction of waste generation and includes composting and prepaid garbage bags, strategies that have been trialled in some PICs. Wales in the United Kingdom has made composting a priority waste stream and included it in recycling targets. Australia has introduced a number of Product Stewardship programs that provide a solid foundation to consider in the Pacific context. The Canadian example brings into focus the many remote communities in the Pacific that are geographically dispersed, providing an example of policy specific to these communities.

3.5.1. South Korea waste management

South Korea initially focused on traditional model of expanding and improving the efficiency of waste management.[40] Incineration for energy and landfilling strategies were employed. Due to a **shortage of available land**, South Korea transitioned its waste strategy to include measures that **reduce the generation** of municipal solid waste. A **volume-based fee system** for waste was implemented as well as schemes for recovery of **food waste**. South Korea is now aiming to achieve a zero-waste society by turning wastes into a resource.[41]

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[38] Pacific Region Infrastructure Facility (PRIF), above n 8

[39] Ibid, Asian Development Bank (ADB), above n 10, Asian Development Bank (ADB), above n 11

[40] Research Office of the Legislative Council Secretariat, Government of Hong Kong, *Information note: South Korea's waste management policies* (2013) <https://www.legco.gov.hk/yr12-13/english/sec/library/1213inc04-e.pdf>

[41] http://wastemanagementreview.com.au/south-korea-legislates-towards-a-zero-waste-society

The *Environmental Preservation Act* of 1978 established the environmental standards for waste discharge as well as the creation of waste disposal and monitoring programs. The *Solid Waste Management Act* was adopted in 1986[42] and amended in 2007. This Act addressed the disposal of refuse and other wastes. It also provided a framework for reducing the generation of wastes, adopting the 3R approach. Classification of wastes were laid out. Every ten years, the Minister is to prepare a **national plan** for the management of wastes.

The next step in the transition of waste management in South Korea was the adoption of the *Act on Promotion of Saving and Recycling of Resources* in 1992. This Act was amended in 2008 and is the basis for reducing household waste. A volume-based rate was introduced for **household garbage**, implemented through the purchase of pre-paid garbage bags from supermarkets. The price of the pre-paid garbage bags is determined by the local government and is based on the cost of collection and disposal of wastes. Fines are imposed for those who dispose of wastes in bags other than the designated pre-paid bags.

Recyclable waste is collected separately from household waste[43] and collection is free of charge. This service is operated by local councils or private waste collectors. The local council or the collector then sorts the items. Bulky waste requires the purchase of stickers from local councils or private collectors.[44] A container deposit scheme is also in operation for soft drinks and alcoholic beverage containers.

The *Act on Promotion of Saving and Recycling of Resources* also restricts the use of **disposable products** by businesses. These include disposable eating utensils, plates, advertising material, shopping bags not made of paper, shampoos, razors and toothbrushes. This list is updated as required.[45]

Packaging waste is regulated by the *Act on the Promotion of Saving and Recycling of Resources* and the *Ordinance on the Standards of Packaging Methods and Material*. To reduce **packaging waste**, materials that are difficult to recycle have been restricted, as well as the number of layers of packaging in a container and the volume of empty space in a box.[46]

Disposing of **food waste** in landfill is prohibited in South Korea. Household food waste must be separated and disposed of in one of three ways:

- Pre-paid bags specific to food waste.
- Stickers or chips are purchased and placed on food waste bins provided by local councils. The stickers or chips are removed on collection. Without the sticker or chip, the bin is not emptied.

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[42] Sang-Hun, L., *Policies for Sustainable Resources Management in the Republic of Korea* (International Policy Research Center. Korea Environment & Resources Corporation, 2006)
[43] www.koreatimes.co.kr/www/nation/2018/12/371_246607.html
[44] Research Office of the Legislative Council Secretariat, Government of Hong Kong, above n 40
[45] Ibid
[46] Ibid

- A magnetic card reader can be used at specific food waste bins that weigh the waste and link it to the identification data stored on the card. The household is charged monthly for their deposits.

Food waste is then composted or used as livestock feed and to create biofuels.[47]

Waste generated by all businesses is classified as **industrial** waste under the *Solid Waste Management Act.* Businesses must develop plans annually for the reduction of waste and report to the government on progress made. Guidelines for Industrial Waste Reduction were developed to assist businesses in this regard. Importers and manufacturers of products that are difficult to recycle or contain hazardous substances[48] (e.g. nappies) are charged an **advance disposal fee**.

Recycling is encouraged through the *Promotion of Construction Waste Recycling Act* for construction waste and the EPR System. Importers and manufacturers must meet mandatory **recycling targets** set for specific items through take-back schemes. Some types of packaging are subject to mandatory recycling. The EPR System was expanded to include eWaste through the *Resource Circulation Act of Electric & Electronic Products and Automobiles*.

Lifecycle considerations are encouraged under the *Promotion of Saving and Recycling of Resources Act.* Importers and producers of automobiles and electronic appliances must consider options for reducing the types of materials used, enhancing the reuse and recyclability of their products (e.g. use of recyclable materials, easier disassembly), reducing hazardous substances and improving light-weighting of products.

Furthermore, the *Promotion of Green Product Purchase Act* was enacted in 2004, which requires the purchase of environmentally-friendly products by public organizations. An **annual procurement policy** must be implemented and efforts must be reported on.

Agricultural waste is also targeted. Plastic film and various containers are collected for recycling or energy recovery.[49]

An interesting initiative is the online 'market' where used products and various wastes are traded between businesses and the community.[50]

3.5.2. United Kingdom – Wales Waste Strategy (Composting)

In Wales, the government seeks to **improve the quality of secondary materials** produced from municipal waste streams in order to increase their uptake by local industry. The overarching waste strategy for Wales is outlined in the 2010 *Towards Zero Waste* document

[47] http://www.innovationseeds.eu/policy-library/core-articles/south-koreas-food-waste-reduction-policies.kl; https://www.livingcircular.veolia.com/en/industry/ecocycle-turns-plastic-waste-solid-fuel-korea

[48] Research Office of the Legislative Council Secretariat, Government of Hong Kong, above n 40

[49] Takeya, D. H., *Collection, disposal and exchange of waste agricultural plastics in Japan, the Republic of Korea and China* (2009) <http://www.techmonitor.net/tm/images/3/31/09jan_feb_sf6.pdf>

[50] See www.re.or.kr

and aims for a zero-waste target by 2050. In addition to the zero-waste strategy, the *Waste (Wales) Measure 2010* and the *Environment (Wales) Act 2016* were enacted.

Part 3 of *Environment (Wales) Act 2016* provides for the **charge of carrier bags**. This includes carrier bags used for the **delivery of goods** to a person in Wales. The Ministers may set a charge for other types of carrier bags. The retailers must donate the net proceeds of the carrier bag charge to charitable purposes, preferably that relate to environmental protection.

Part 4 of *Environment (Wales) Act 2016* deals with the **separation of wastes for collection** and the disposal of wastes. The Minister is given powers to enact regulations accordingly, including the prohibition or regulation of waste incineration.

Incremental targets are set in the *Towards Zero Waste* strategy[51] and include a maximum of 5% of waste to landfill by 2024/25. Other targets are legislated in the *Waste (Wales) Measure 2010.* **Composting is included in the calculation of recycling rates**. Organic waste is therefore restricted from being landfilled and also required to meet certain recycling targets. A Quality Protocol for Compost has also been developed that regulates business composting activities.

The *Waste (Wales) Measure 2010* provides for recycling, preparation for re-use and composting targets. The target recycling rates have been set as follows:

- 52% for 2012/13
- 58% for 2015/16
- 64% for 2019/20
- 70% for 2024/25

Local authorities are to ensure these minimum recovery rates of municipal waste are achieved, if not exceeded. These can be through **recycling, preparation for re-use and/or composting** (including any other form of transformation by biological processes).[52] Welsh Ministers may set individual targets for each of these processes. These targets are measured as the total amount of waste collected by weight by a local authority, combined with waste deposited in facilities provided by the local authority as specified in the regulation.

Ministers may develop regulations that specify the indicators by which achievement of the targets can be measured. These targets can relate to preventing, reducing, collecting, managing, treating or disposing of waste. The regulation also provides for **penalties for local authorities** that do not meet the targets specified for recycling, preparation for re-use and composting.[53]

The Measure also stipulates the **separation of wastes** by waste collection authorities and businesses.[54] Premises other than domestic properties and caravans may not dispose of food

[51] Welsh Assembly Government, *Towards Zero Waste. One Wales: One Planet* (2010)
[52] Art. 3
[53] Welsh Assembly Government, above n 51
[54] Art. 65

waste into public sewers.[55] The *Household Waste Recycling Act 2003* legislates the **separate collection of recyclable waste from households by waste authorities**. This includes "household waste which is capable of being recycled or composted."

The *Recycling, Preparation for Re-use and Composting Targets (Definitions) (Wales) Order 2011* supplements the *Waste (Wales) Measure 2010* by setting out the **conditions under which waste may be considered composted** for the purpose of determining targets.[56] The *Controlled Waste (England and Wales) Regulations 2012* provide classification of waste, namely household waste, industrial waste or commercial waste. Those wastes for which charges may be levied for collection and disposal are listed, including garden waste.

The *Landfill Allowances Scheme (Wales) Regulations 2004* aims to significantly **reduce the amount of biodegradable municipal waste sent to landfills**. It establishes an obligation for waste disposal authorities to keep records of the amount of collected municipal waste, the amount of municipal waste sent to landfills and the amount of municipal waste sent to other waste facilities. Similarly, **landfill operators must maintain records** of waste received, its source and any treatment prior to landfilling. In particular, both must report on the amount of biodegradable municipal waste sent to landfills.

As a result of these efforts, Wales improved its recycling rate by 19.7% from 2009/10 to 2015/16, reaching a rate of 60.2% recycled materials. Food waste and garden waste is a key component of England's new strategy for waste and resources, Our Waste, Our Resources: A Strategy for England.[57]

3.5.3. Australia National Waste Policy and Product Stewardship programs

At the Australian federal level, the National Environment Protection Council (NEPC) was established under the *National Environment Protection Council Act 1994*.[58] As per the Act, the Council can establish National Environment Protection Measures (NEPMs) and report on implementation in the different jurisdictions. Included in this is implementation of the *National Waste Policy*.[59]

Every two years, a **national waste report** is produced that summarises the status of waste in Australia and provides data on waste generation, source streams, materials and fates. In addition, a National Waste Reporting Tool is published that contains the data reported for each year along with a National Waste Database that contains the data collected for all available years. This allows for **individual research**.

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[55] Art. 66
[56] Welsh Government, *Towards Zero Waste 2010 - 2050: Progress Report* (2015)
[57] Defra (Resources & Waste Strategy Team), *Our Waste, Our Resources: A Strategy for England* (2018) <https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/765914/resources-waste-strategy-dec-2018.pdf>
[58] Available at: https://www.legislation.gov.au/Series/C2004A04799
[59] Australian Government, *National Waste Policy: Less Waste, More Resources* (2018) <http://www.environment.gov.au/system/files/resources/d523f4e9-d958-466b-9fd1-3b7d6283f006/files/national-waste-policy-2018.pdf>

Australia first published a National Waste Policy in 2009. This was updated in 2018 after a process of stakeholder consultation. The policy includes the Sustainable Development Goals (SDGs), particularly SDG12 – Sustainable Consumption and Production. The overall aim of the policy is to reduce waste, to recover resources and to implement Australia's obligations under international agreements. These agreements include the Basel Convention and the Waigani Convention.

The National Waste Policy outlines a number of integrated strategies. These are:

1. Waste avoidance
2. Design
3. Knowledge sharing, education and behaviour change
4. Product stewardship
5. A common approach
6. Improving access
7. Increasing industry capacity
8. Sustainable procurement by governments
9. Sustainable procurement by business and individuals
10. Plastics and packaging
11. Sound management of chemicals and hazardous waste
12. Reduce organic waste
13. Data and reporting
14. Market development and research.

Product Stewardship is a key element of Australia's national solid waste management policy, supported by the *Product Stewardship Act 2011*. This act provides for voluntary, co-regulatory and mandatory product stewardship. Under voluntary programs, **industry-funded** schemes are not regulated but can apply for accreditation under the Act. Schemes that are accredited are monitored by the government. Product stewardship schemes that are **co-regulatory are industry-operated**, but **minimum requirements and achievements** are set by the government. Mandatory product stewardship schemes operate under legal obligations set by the government with little flexibility in how these obligations are to be met. Australia has no product stewardship schemes adopted under the Act that are 100% mandatory. Waste management that falls out of the product stewardship schemes are the **responsibility of state, territory and local governments**.

Each year a list of prioritised product groups is produced for those products under consideration for product stewardship programmes. A **Regulatory Impact Statement** must be undertaken to inform the decision to adopt a new product stewardship scheme.

Under consideration in 2017/18 were plastic microbeads and products containing them, batteries, photovoltaic systems, electrical and electronic products and plastic oil containers.

Under the Product Stewardship element, programmes have been developed to deal with the following:[60]

- Voluntary schemes
    - Mobile phones – see MobileMuster, Chapter 5 – Best Practices
    - Tyres – the industry-led National Tyre Product Stewardship Scheme is voluntary with a funding mechanism operated by industry and established by tyre importers.
    - Paint – the industry-led Paintback has been in place since April 2016.
    - Mercury-containing lamps – FluoroCycle targets lighting in commercial and public spaces.
- Co-regulatory schemes
    - TVs and computers – an industry-funded collection and recycling service that supplements government eWaste programmes.[61]
    - Packaging – see the Australian Packaging Covenant (APC), Chapter 5 – Best Practices.

No product stewardship programs have been adopted in Australia for batteries. Batteries have been included on the products list for the last five years and efforts with industry and State governments are underway.

The Australian Department of Environment and Energy conducted a cost benefit analysis of a product stewardship scheme for domestic air conditioners and refrigerators, but found "no net benefit to society." Instead, the department is collaborating with industry to design retailer guidelines for **take-back schemes** when customers purchase new appliances.

The Product Stewardship for Oil Scheme[62] is a **government-administered scheme** that aims to increase the recycling of used oil as per the *Product Stewardship (Oil) Act 2000*. Under this Act, provision of new oil attracts an 8.5c/litre levy, which is used to **fund benefit payments to used oil recyclers**. The *Product Stewardship (Oil) Regulations 2000* sets out the recycling benefit rates per litre of recycled product. The overall objective of the scheme is to remove the public burden of preventing pollution from used oil by **making the industry that profits from the production and use of oil responsible for the cost of recycling that oil**. An industry-led scheme dealt with used plastic oil containers not covered by the Act, but this has slowly declined in participation and is no longer operational.

A common practice within integrated waste management policies is to implement a **waste levy** on products disposed of in landfill. In the State of New South Wales, the government imposes a levy on the operators of licensed recycling, processing and waste storage facilities. In 2015, the waste levy framework changed in order to, inter alia, **reduce barriers for new entrants** into the waste industry, reduce fraud and ensure turnover of stock.

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[60] https://www.environment.gov.au/protection/waste-resource-recovery/product-stewardship/projects
[61] See https://techcollect.com.au/liable-parties
[62] http://www.environment.gov.au/protection/used-oil-recycling/product-stewardship-oil-program

Licensed facilities are required to operate a weighbridge. A Waste Contribution Monthly Report must include the following:

- waste received and transported from site,
- waste stream and waste type,
- where the waste originated from and went to, and
- waste processed on site.[63]

Once the government has assessed the information, a levy is payable if waste has been stockpiled on site for more than 12 months (except if processed on site as per a resource recovery order), if stockpiled waste exceeds the amount authorised in licence conditions, or the waste has been transported elsewhere for unlawful disposal/reuse.

The use of funds raised from these levies varies in different States. In New South Wales, the levies are added to consolidated funds, but in Queensland they are used to **assist recycling processes**.[64] In Victoria, recycling is promoted through the Resource Recovery Infrastructure Fund, which is funded by the State government.[65]

3.5.4. Canadian Municipal Solid Waste Management in remote communities

The Canadian government has adopted a number of legislative and policy approaches to address integrated waste management in an environmentally sustainable manner. These include:

- Canadian Environmental Protection Act, 1999
    - Products Containing Mercury Regulations (SOR/2014-254)
    - Export and Import of Hazardous Waste and Hazardous Recyclable Material Regulations (SOR/2005-149)
    - PCB Waste Export Regulations, 1996 (SOR/97-109)
- Strategy on Zero Plastic Waste
- Guides:
    - Export and Import of Hazardous Waste and Hazardous Recyclable Material Regulations - Guide to classification
    - Export and Import of Hazardous Waste and Hazardous Recyclable Material Regulations - User Guide

Canada has also adopted a nation-wide action plan on EPR. An example of lead acid batteries is discussed further in Chapter 6 – Extended Producer Responsibility. A summary of EPR programs in Canada as of 2015 is provided.[66]

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[63] https://www.epa.nsw.gov.au/your-environment/waste/waste-overview/waste-regulations/poeo-waste-reg-2014/waste-levy-faqs

[64] https://www.environment.gov.au/protection/waste-resource-recovery/national-waste-policy

[65] https://www.insidewaste.com.au/index.php/2018/12/21/another-funding-boost-for-victorias-recycling-sector/

[66] Giroux, L., *State of Waste Management in Canada* (Canadian Council of Ministers of Environment, 2014)

Exhibit 16: MSW Waste Diversion (EPR and Stewardship Programs) CAP EPR Phase 1 Materials

Material	BC	AB	SK	MB	ON	QC	PE	NB	NS	NL	YT	NT	NU
Packaging - Milk Containers	E-V	P	E-V	S	S	S	P	E-V	S	(E-V)	consider	P	
Packaging - Beverage Containers	E-L	P	P	E-L	P liquor/wine	P beer & soft drinks	P	P	P	P	P	P	(P) liquor/ beer
Multi-packaging and printed materials	E-L	consider	S	S	S	S	consider	consider	consider	consider			
Electronics - Audio-visual and Telecom	E-L	consider	E-L	E-L	E-L	E-L	E-L	pending	E-L	E-L	consider	consider	
Electronics - cell phones	E-L	E-V	E-V	E-L	E-L	E-L	E-L	E-V*	E-L	E-L	E-V consider P	E-V	
Electronics- computers, accessories and IT equipment	E-L	P	E-L	E-L	E-L	E-L	E-L	pending	E-L	E-L	consider	consider	
Electronics - tools	E-L	consider				consider	consider						
Electronics - TVs	E-L	P	E-L	E-L	E-L	E-L	E-L	pending	E-L	E-L	consider	consider	
HHSW- batteries	E-L	S*	E-V	E-L	E-L single use	E-L	E-V	E-V	E-V	E-V*			
HHSW- corrosives & irritants	E-L	S*	consider	E-L corrosives	E-L	consider	P		consider	consider			
HHSW- aerosols, solvents & flammables	E-L	S*	consider	E-L solvents & flammables	E-L	consider	P		consider	consider			
HHSW- mercury lamps, other mercury products	E-L	consider	consider	E-L	P	E-L	pending		consider	consider			
HHSW - paint	E-L	P	E-L	E-L	E-L	E-L	E-L	E-L	E-L	E-L			
HHSW -pesticides/ fertilizers & containers	E-L pesticides	E-V	E-V*	E-L	E-L	E-V	E-V	E-V	E-V	E-V			
HHSW-pharmaceuticals	E-L	E-V	E-V	E-L	E-L	E-V	pending	E-V	E-V*	E-V	E-V		E-V
HHSW- sharps/syringes			consider	E-L	E-L	consider	pending		E-V*	consider	E-V		
Automotive -batteries	E-L			E-L		consider	pending	E-V		E-V*			
Automotive -tires	E-L	P	P	E-L	E-L	P*	P	P*	P	P	P		
Automotive -used oil, oil containers and/or filters	E-L	P	E-L	E-L	E-L (containers and filters)	E-L	pending	E-L	P* (used oil)	P*			
Automotive -other (e.g. glycol)	E-L	consider	E-L	E-L	E-L	E-L	pending	E-L	consider	pending			

Notes: * = legislated EPR being considered; (P) = Deposit is charged territory-wide, collection depot only in Iqaluit. This inventory does not take into account initiatives led by individual manufacturers or retailers to collect end-of-life products. There is a national stewardship program for mercury switches (end-of-life vehicles, ELVs) as part of the federal notice to prepare and implement pollution prevention plans for mercury releases from ELVs processed by steel mills. Currently, there are no legislated EPR requirements at the federal level.

Legislated EPR Program: E-L Voluntary EPR Program: E-V

All shared responsibility programs are shaded in green cells with an S: S

All Product Stewardship programs are shaded in orange cells with a P: P

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Figure 1: Summary of Canadian EPR programs

3.5.4.1. Remote communities

The Canadian *Solid Waste Management for Northern and Remote Communities (2017)* is a **planning and technical guidance document** for management of municipal solid waste in the northern and **remote communities**[67] where some of the challenges mirror those of non-urban areas within PICs. The document does not address sewage sludge or bio-solids. Incineration is presented as an option for residual wastes in these areas but is not discussed here due to the large power requirements, a valuable and limited commodity in PICs.

Guidance is provided on the location and design of landfills, recognising that even a zero-waste goal will realistically not attain 100% reduction, reuse and recycling, with some waste requiring disposal. Beyond open burning, landfill and incineration, the option available to remote Canadian communities is to transfer waste to **regional treatment facilities**.

The guidelines encourage the prioritisation of identified waste management improvements using a **risk-based approach** that categorises waste types into high, medium and low priority based on risk to human health, environment, proportion of total waste stream, etc. The guidelines provide suggestions for addressing these risks with regards landfills, municipal facilities and all other wastes (e.g. hazardous, eWaste, vehicles). Such an approach may not necessarily result in a pure 3R hierarchy, but may assist during a transitional phase.

The overall objective for remote communities is to **transition any existing facilities from disposal to diversion** through the following goals:

- *Waste will be sorted, processed, and stored temporarily on-site for reuse, recycling, composting, or treatment;*
- *Hazardous and special waste and hazardous substances will be kept separate and stored temporarily and safely until proper treatment or disposal;*
- *The open burning of waste will become a thing of the past;*
- *The quantity of waste requiring disposal will be greatly reduced and any residual waste disposal on-site will be done in an environmentally-sound manner; and*
- *Community members and the private sector will be actively engaged in sustainable waste diversion activities.*

[67] Environment and Climate Change Canada, *Solid Waste Management for Northern and Remote Communities: Planning and Technical Guidance Document* (2017)

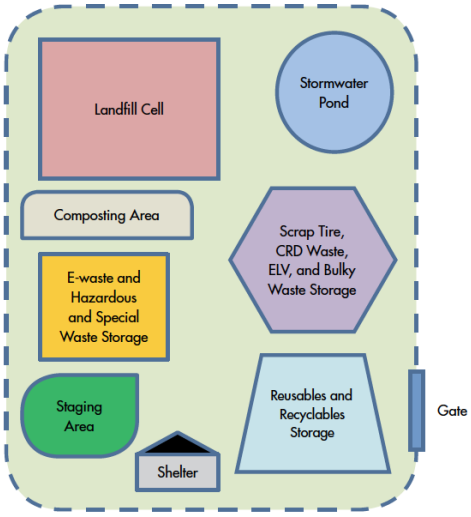

Figure 2: Co-locating diversion facilities with landfill can reduce costs, as illustrated in the guidelines.[68]

Where information about current municipal solid waste (MSW) management practices are unknown, some key questions are provided in the guidelines for interviewing local authorities and/or other appropriate stakeholders. It is possible that **no records** are kept in remote communities and further observations may be required to gain first estimates.

Table 8: Example questions for remote community interviews regarding waste management

Identifying current issues	Identifying challenges and needs	Examples of measures of success
Are there human health (including safety) or environmental concerns associated with the existing MSW facility?	Based on the waste characterization and MSW facility audit, what are the main challenges?	Quantity of hazardous and special waste shipped out for treatment/disposal
How do the existing design and operations compare with local regulatory requirements?	What are the current waste management needs of the community?	Number of visits to the free store and current inventory
How do the existing design and operations compare with the recommendations outlined in this document?	What are the anticipated population growth, economic activities, and waste management needs for the future?	Number of end-of-life vehicles shipped out of the community
What materials are segregated and treated/disposed of off-site?		Quantity of compost produced
What materials are disposed of on-site?		Quantity of recyclables shipped out for recycling
What materials are recycled or composted?		
What is the remaining life of the existing MSW facility in terms of disposal capacity?		
What possibilities exist for upgrading or expanding the existing MSW facility or building a new one?		

[68] Ibid

3.6. Discussion

Included in integrated waste management is the need for **data and information** that provides quantification on **current waste flows and future trends**. Information gathering has taken place under various donor programmes in many PICs, but management systems could benefit from further research and development, including the development of infrastructure.

This study has highlighted a number of initiatives and waste management strategies adopted in different countries with varying cultural, geographic and economic situations. While in the transition phase, the Solomon Islands and Vanuatu could consider the following strategies that have been demonstrated and which build on existing legislation to assist in implementing an integrated waste management approach as per the national strategies of each country:

- **Reduce the generation of waste**
    - Ban single-use products – already underway in some PICs, including Vanuatu, and under consideration in Solomon Islands.
    - Pre-paid garbage bags – already underway in Vanuatu.

- **Divert recyclable and reusable waste from landfill and illegal dumpsites**
    - Separate waste at the source
        - Preferably into 3 waste streams: recyclable, compostable and general waste.
    - Landfill levies
        - Higher levy (or ban) for recyclable, reusable and compostable waste to incentivise diversion back into the economy.
    - Encourage collection by the community and business
        - Container deposit schemes.
        - Advance recycle/disposal fees paid by distributors (combined with reverse distribution).

- **Alleviate the cost burden to local councils of waste management**
    - Reduce transport costs
        - In-situ use waste
        - Backloading and reverse distribution
        - On-demand collection
    - Polluter pays and user pays schemes
        - Advance recycling/disposal fee paid by manufacturers
        - Pre-paid garbage bags – already in pilot phase in Vanuatu. This should be implemented in parallel with separate collection of organic waste and recyclables to reduce the need to purchase garbage bags.
        - Foreign visitor tax
    - Extended producer responsibility and Product Stewardship schemes

The strategies outlined here are further elaborated in Chapters 4-6. When assessing current issues and solutions, additional questions relevant to non-urban communities in PICs could provide further opportunities, such as:

- What transport options the community (delivery truck, boat, flight, etc)?
- How often are these services provided?

- What are the communities transport access conditions, e.g. quality of roads, size of wharves?
- What tourist facilities are available, e.g. accommodation, day trips, sailing boats, other?
- How many monthly visitors are there to the local region, categorized where possible?

Waste management plans should be made in consultation with women and church community groups, village chiefs, local businesses, regional collection, processing and recycling centres as well as local tourist facilities (attractions, hotels, etc) and other stakeholders. Further advice relevant to PICs is provided in the guidelines to solid waste management develop under the JPRISM I project.[69]

[69] SPREP, *Practical Guide to Solid Waste Management in Pacific Island Countries and Territories* (2018)

4. POLLUTER PAYS PROGRAMMES

4.1. Objective of the study

This study aims to *review regional guidance to identify suitable options for national implementation of polluter-pays programmes.*

Chapter 3 - Integrated Waste Management, Table 1 summarises the measures included in regional instruments that promote the use of the Polluter Pays Principle with regards the management of waste. This may be explicit or inferred, mandatory of voluntary. Table 4 and Table 5 of Chapter 3 also summarise the adoption of the polluter pays principle within the national instruments of the Solomon Islands and Vanuatu.

The *Solomon Islands National Waste Management and Pollution Control Strategy 2017-2026* suggests reviewing the current tax system and user pays policy to include the informal settlement communities in order to enable councils to provide waste and pollution management services to these areas. In addition, the strategy promotes undertaking a cost-benefit analysis of different options for long-term finance mechanisms through implementation of the polluter pays principle, the extended producer/importer responsibility, container deposit schemes and a tourism tax.

The Vanuatu *National Environment Policy and Implementation Plan 2016-2030* suggests establishing incentive schemes that implement the polluter pays principle by encouraging cleaner production and waste recovery. A target is set of 2025, by when at least one incentive scheme is to established under the *Waste Management Act.* In support of this, regulations should be developed to support the polluter pays principle.

This study provides a review of selected polluter pays programs for consideration within Solomon Islands and Vanuatu waste management strategies.

4.2. Defining the polluter pays principle

As per the Rio Declaration on Environment and Development, Principle 16 states:

> *"National authorities should endeavour to promote the internalization of environmental costs and the use of economic instruments, taking into account the approach that the polluter should, in principle, bear the cost of pollution, with due regard to the public interest and without distorting international trade and investment."*[70]

Extended Producer Responsibility (EPR) is often implemented as a financing tool to pay for the end-of-life treatment of products, usually the collection and recycling process. However, without linking this financial obligation to an incentive to design the product so that environmental and human harm is minimised and end-of-life processes are improved, these

[70] http://www.un.org/documents/ga/conf151/aconf15126-1annex1.htm

schemes are essentially implementing the Polluter Pays principle. EPR is therefore an extension of the polluter pays principle.[71] As described in the *State of Waste Management in Canada (2014)* "the concept of EPR in Canada has primarily translated into increased diversion activity since many producers pass the recycling program cost on to consumers at point of sale."[72] Whether the polluter pays or the user pays for the cost of collection and recycling, the design-for-environment or design-for-disposal is not an essential element of the polluter pays principle.

For the purposes of this study, a distinction is made between the two principles. The Polluter Pays principle establishes an expectation of industry[73] to the costs of prevention, collection and clean up, including a reduction in the generation of waste from industry processes. Prevention can include design change, but for the purposes of this study and to prevent overlap, explicit incentive to modify the design of products to enhance end-of-life treatment is reserved for and further discussed in Chapter 6 - EPR Programmes.

The Polluter Pays principle includes:

- Collection costs,
- Prevention (e.g. Operation Clean Sweep to contain nurdles on-site),
- User pays, and
- Post pollution clean-up costs.

The Extended Producer Responsibility principle includes:

- Collection costs,
- Design for recycling and reuse,
- Design to reduce harm (pollution, carbon emissions, resource efficiency),
- Product Stewardship, and
- Lifecycle assessment.

As per the Solomon Islands *National Waste Management and Pollution Control Strategy 2017-2026*, the following approaches are promoted:

- Explore the possibility of establishing a trust fund for waste management and pollution control programmes managed by a steering committee, supported by an agreed and approved plan, and an approved procurement system.
- Improve consultation and links among lead agencies to effectively allocate resources for waste and pollution control activities as part of their annual budgeting process.
- Review the current Honiara City Council (HCC) tax system and user pay policy to include people living in squatter settlements to enable the council to provide waste and pollution management services.

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[71] Hon. Justice Brian J Preston, *Sustainable Development Law in the Courts: The Polluter Pays Principle (The 16th Commonwealth Law Conference, Hong Kong, 7 April 2009)* (2009)
[72] Giroux, L., above n 66
[73] The term 'industry' includes importers, manufacturers and retailers, sometimes collectively referred to as producers.

- Undertake a cost-benefit analysis of options to implement polluter pay, extended producer/importer responsibility, Container Deposit Legislation programmes and a tourism tax as long-term finance mechanisms.[74]

Within the Solomon Islands, the use of dedicated funds has proved successful in the city of Luganville. Here, the municipal council dedicated a portion of its budget to waste management.

4.3. Examples of polluter pays programmes

Polluter Pays programmes involve payment of a levy by a party responsible for placing a product on a market. Generally, this is to pay for the cost of collection, handling and end-of-life treatment of the product. Polluter Pays programmes can be an effective means of enhancing waste management services, particularly when payments are made to a fund that is dedicated to waste management operations.

Contributions to special waste management funds can include taxes or levies on imported products, landfill disposal fees, entry fees for foreign visitors to a country or attraction, pay-as-you-throw programs (e.g. pre-paid garbage bags) and property rates payable by households and commercial operations.

A well-known example of the Polluter Pays principle is the Waste Materials Fund operated in Kiribati. Designed in collaboration with the Kiribati Customs Service, a levy of 5c for aluminium cans and PET bottles, and $5 for lead acid batteries is charged on import of these products. This fee is collected by the Kiribati Customs Service and deposited in the Special Fund. This fee is then passed on to the consumer by the retailer as a deposit. A private operator pays a 4c refund on return to collection points of the regulated aluminium cans and PET bottles, as well as the full $5 on lead acid batteries. The private operator then reclaims the full deposit of 5c or $5 from the Special Fund. In this way, the private materials recovery operator remains financially viable through retaining the 1c difference and the profit of selling all the recovered items internationally. The program was established through the *Special Fund (Waste Materials Recovery) Act 2004* with supporting regulations.

The examples presented have been selected for their relevance to the Pacific context and for the varied options they provide. The Palau visitor fee is an example of “user pays” and is likely the highest globally, providing a strong regional incentive to implement such a scheme in other PICs. Packaging waste is significant issues in the Pacific and, due to the heavy reliance on imported products in the region, the Green Dot scheme is a good example of a regionally applied Polluter Pays program that could be applied in the PIC context to help fund waste management. Similarly, eWaste is a rapidly growing issue in the region and the Swiss example provides a mechanism where the user contributes to the costs of transport and recycling at the end of product life. Transport of bulky waste presents issues in the Pacific, particularly in remote communities. The Japanese approach is provided as an ‘extreme’ example and,

[74] Para 9.8.1, 9.8.2, 9.8.4, 9.8.7

although not likely to be adopted completely by PICs, shows how the user can contribute to the collection and recycling of end-of-life home appliances.

4.3.1. Environmental User pays: Palau visitor fee

Brief description and key funding mechanism

Foreign visitors to Palau must pay an environmental tax. This tax includes the previously levied departure tax, but is now levied on the sale of international airfares prior to entering Palau. The total environmental tax is divided across various specific funds as defined in RPPL No.10-02: Pristine Paradise Environmental Fee and amended by RPPL No. 10-16. Exemptions to the Pristine Paradise Environmental Fee are in place.

Foreign visitor fees have been implemented in other PICs. A departure tax of NZ$80 is charged to visitors when leaving Niue. Fiji levies a fixed percentage on services provided in-country, such as accommodation, recreational activities and hospitality.

How does "environmental user pays" work?

In Palau, a visitor fee is collected for every visitor that does not hold a Palauan passport. The fee was initially made up of a US$20 departure tax and a US$30 Environmental Protection Fee ("Green Fee") for a total levy of US$50. On 1 January 2018 a revised US$100 visitor fee came into effect.

The new US$100 fee is initially collected by including the amount in the sale of international airline ticket. The fee is allocated as follows:

- $10.00 - Fisheries Protection Trust Fund.
- $12.50 - divided among states as follows:
  - 70% divided in equal shares among the states, and
  - 30% apportioned according to population of the states.[75]
- $25.00 - National Treasury (for security, operation, maintenance, and improvement of the Palau International Airport provided all funds previously allocated for this purpose have been appropriated to the Civil Service Pension Fund).
- $30.00 – the previous "Green Fee."
- $22.50 - National Treasury.

The "Green Fee" supports the Protected Areas Network and are **administered by an independent non-profit organisation**.[76]

Those exempt from paying the fee, which is refunded upon arrival into the Republic of Palau, are:

- Individuals holding a Palauan passport, or who otherwise demonstrate proof of Palauan citizenship,
- Spouses of Palauan passport holders or Palauan citizens,

[75] Available at: https://www.palaugov.pw/wp-content/uploads/2017/04/RPPL-No.-10-02-re.-Amendments-to-Environmental-Impact-Fee.pdf
[76] See http://www.palaupanfund.org/pan.html

- Masters, pilots, and other Crew members while on official duty of any vessel or aircraft lawfully operating as a commercial carrier or charter, if such persons show evidence of having paid the PPEF,
- Members of a diplomatic mission in the course of their official duties formally recognized by the Ministry of State, and
- Transit Passengers, if such persons show evidence of having paid the PPEF.

Similar exemptions would apply to accommodation charges, as for Fiji.

Other examples include Venice (Italy) where plans are underway to charge visitors to the city a 'disembarkation contribution' or tax of $11.50 on entering the World Heritage site. This captures day-trippers as opposed to charging a hotel tax. The fee will contribute to the costs of cleaning the city's waste, much of which is generated by tourists and which requires materials to be transported by boat.[77] Similarly, Spain applies a Sustainable Tourist Tax to visitors as a means to maintaining natural resources. Other European countries and Japan[78] charge a tourist tax, with proceeds mostly being spent on enhancing tourism. New Zealand is considering a $35 tourist levy, with proceeds possibly being split evenly between conservation and tourism infrastructure. Bali is proposing a $10 visitor fee to help preserve the local environment and culture.[79]

Advantages of "environmental user pays"

Solomon Islands *National Waste Management and Pollution Control Strategy 2017-2026* suggests exploring the possibility of establishing a trust fund for waste management and pollution control programmes[80] undertaking a cost-benefit analysis of options to implement a tourism tax one of a few suggested long-term finance mechanisms.[81]

The Palau example of a visitor fee could be adapted by Solomon Islands and Vanuatu to charge visitors a smaller "Waste Management Fee" that is deposited into a dedicated fund to be used for waste management improvements. The collection of this fee could be administered at any arrival location (airport, port, etc) or through an accommodation tax.

Consideration would need to be given to visitors who arrive by sea and do not make use of local accommodation (i.e. live on their yacht) as well as live-aboard diving operators.

Palau also charges a hotel tax, similar to Fiji. This could be considered in Solomon Islands and Vanuatu, with appropriate exemptions.

Considerations in the context of PICs

There are many environmental, social and economic challenges facing PICs. This includes improvement of roads to enable collection of packaging waste from container deposit

[77] https://www.weforum.org/agenda/2019/01/venice-will-now-start-charging-tourists-an-entrance-fee
[78] https://www.jnto.org.au/international-tourist-tax/
[79] https://www.theguardian.com/travel/2019/jan/25/bali-plans-tourist-tax-to-tackle-plastic-pollution
[80] Para. 9.8.1
[81] Para. 9.8.7

collection points. **Prioritising waste management** as the single output of a national environment fund could be contested. It may therefore be necessary to either apportion part of the fund's proceeds to waste management or establish a **separate waste management fund** with specific levies dedicated to that fund.

The Guidelines for the implementation of MARPOL Annex V recognises that the "augmentation of **port reception facilities** to serve ship traffic without undue delay or inconvenience may call for capital investment from port and terminal operators as well as the garbage management companies serving those ports." Suggestions to achieve this include "**special funds** to assist in problem situations such as remote ports with no land-based garbage management system in which to deliver ships' garbage." A special waste management fund could consider such situations in conjunction with the best practice of **backloading** discussed in Chapter 5.

4.3.2. Packaging Recovery - Green Dot Trademark in Germany

Brief description and key funding mechanism

The system is based on manufacturers paying a license fee that permits the labelling of their packaging with the Green Dot trademark logo. The logo indicates to households that the item should be placed in a specific yellow bin. The licensing scheme then funds the collection of recyclables from these bins.

How does the Green Dot Trademark work?

The Green Dot trademark[82] is used by **packaging recovery** organisations in 29 countries. In Germany, the program assists packaging manufacturers, described as the first to professionally circulate the packaging, or import the packaging, to the German market (including online retailers) to comply with the *European Packaging and Packaging Waste Directive 94/62* and the German Packaging Ordinance, effective in 1991, under the Waste Act. As of 1 January 2019, the new German Packaging Act replaces the Ordinance.

The **licensing fee** paid by manufactures that permits the **labelling of their packaging** with the Green Dot trademark logo is determined by the packaging material used as well as the weight of material the manufacturer is responsible for placing on the German market ("first circulators"). There is **no minimum weight** under the German regulation and all manufacturers must join one of ten national packaging recovery organisations. Under the Green Dot scheme, there is a **minimum participation fee**.

The **dual system** makes use of yellow bins, which are collected alongside regular household waste placed in separate bins. All packaging displaying a Green Dot logo is placed in the yellow bin. In addition, bottle-banks are provided for the same used sales packaging bearing the Green Dot logo.[83] The scheme has no collection infrastructure, but **contracts waste management companies** for the provision of the yellow bins and the collection of single-use packaging in the yellow bins and from the bottle-banks. Similarly, recycling companies can

[82] https://www.pro-e.org/the-green-dot-trademark
[83] https://www.gruener-punkt.de/en

also be contracted for the processing of the collected single-use packaging. Thus, the collection, sorting and recovery of single-use packaging covered by the scheme is funded through the **sale of licenses and of recyclable material** to processing facilities.

The single-use packaging addressed by the regulation is predominantly household packaging resulting from a sale and where the **final point of collection** is *typically* a private consumer. This includes sales packaging that is filled with a consumable and covers packing material, secondary packaging, disposable plates and shopping bags.

The new German Packaging Act introduces a **Central Packaging Registry**. Any manufacturer must register before placing any regulated packing on the German market. Non-registration is an offence. A clear distinction must also be made on beverage packaging to indicate which are **single-use** and which are **refillable** packaging.

Results of the Green Dot Trademark

The original Packaging Ordinance came into effect in 1991. From that point to the year 2000, the volume of single-use packaging decreased by 14%. Lightweight packaging also became more prevalent.

Advantages of the Green Dot Trademark

In order to be successful, a licensing scheme requires a **larger number of participants** to spread the costs of collection, sorting and recycling across multiple manufacturers, thereby making the scheme more affordable. This may be assisted by the new Central Packaging Registry.

In addition, the **simplicity** of a dual bin system with all licensed packaging only being placed in one bin makes compliance by households more likely.

The scheme is sustained by **two sources of income**, namely the sale of licenses by the scheme and the sale of the sorted recyclable material to processing facilities by collectors. Although the cost of a license is negligible per item sold, the licence fees for manufacturers are relatively high. This **incentivises a reduction** in the use of single-use packaging but also the **choice in material** used. Higher fees also assist in covering the costs of dealing with unlicensed packaging that is placed in yellow bins.

The reach of the trademark is dependent on the relevant national legislation. In the case of Germany, the new German Packaging Act and the previous Packaging Ordinance included **online retailers** in the **definitions of manufacturer**. The types of packaging regulated was also based on the **typical final accumulation point**, which allowed for inclusion of transport and other types packaging, such as secondary packaging. Such a licensing scheme therefore lends itself to a regional approach spanning all PICs with varying local requirements. Exemptions could also be made for smaller retailers and markets.

The inclusion of secondary packaging would assist in achieving the goal of reducing pollution of polystyrene packaging around electronic and white goods as listed in Pacific Regional Action Plan on Marine Litter.

Local councils are also able to contract to the scheme to provide collection and sorting services. This could assist councils in PICs to generate funds for waste management services.

Considerations in the context of PICs

The Green Dot logo is not to be confused with an environmental symbol. Instead it is a '**financing symbol**' indicating the manufacturer has contributed to the costs of collection, sorting and recycling.

The current scheme mostly deals with single-use household packaging. Considerations are underway to expand the scheme to include other used metal and plastic items and possibly used electrical devices. The scheme also does not cover commercial and industrial waste streams.

Care must be taken when combining a system such as Green Dot **in parallel with a container deposit scheme**. Glass bottles that are part of a reusable scheme or a separate container deposit scheme, may be disposed of in Green Dot recycling bottle-banks. The new German Packaging Act requires clear labelling that indicates which beverage packaging is designated for refill and which is single-use. This may assist in guiding the consumer to make the right choice of disposal, together with clear labelling at bottle-banks.

Higher deposits for single-use packaging compared to reusable packaging can reduce the purchasing of single-use packaging, in turn reducing the financial income of such licensing schemes and their ability to fund waste collection systems.

A **tender process** should be used for revision of the selection of waste management companies and recycling facilities. This prevents a monopoly and allows for **competition** and new entries to the market, particularly those that may use newer and more efficient technologies. All tenderers should adhere to strict environmental controls as per national legislation.

4.3.3. User pays: eWaste in Switzerland

Brief description and key funding mechanism

An advanced recycling fee is applied to importers, manufacturers and distributors of regulated electrical products that are members of a government-approved Producer Responsibility Organization (PRO). This fee is passed on to the consumer. A co-regulatory system allows for voluntary sectoral agreements which are administered by government-approved institutions. Physical and financial responsibility is placed on the importers and manufacturers for the lifecycle of their products.[84]

How does "user pays - eWaste" work?

Under the *Regulation on the Return, Taking Back and Disposal of Electrical and Electronic Equipment (ORDEE),* which came into effect in 1998, all retailers, manufacturers and

[84] http://www.swicorecycling.ch/en/home

importers are required to take back appliances that are **of the same type** as the products they trade. This is **independent of the brand**, whether the product was purchased from them or whether the consumer is purchasing a new product. Importers and manufacturers are responsible for taking back the brands they have imported or manufactured, also **free of charge**. All collected products must be disposed of in an environmentally-friendly manner, which excludes landfill.

As per the Regulation, consumers (companies or private individuals) are prohibited from placing end-of-life appliance in household waste or collections for bulky items, but must return these **free of charge**[85] to a dealer, the manufacturer or importer, an approved disposal company or a designated collection point.[86]

Four producer responsibility organisations (PROs) exist. SWICO manages the collection of IT products and "brown goods" such as televisions, while bulky household "white goods", such as washing machines and refrigerators, are the responsibility of SENS. Lighting equipment that falls under eWaste is collected by SLRS and INOBAT deals with battery recycling. These organisations administer and spend the prepaid disposal fee on behalf of the Swiss government.[87]

Together with its members, SWICO has developed the SWICO **Recycling Convention**, as well as a **Code of Practice** for the ethical behaviour of members.[88] The Convention is based on the *Regulation on the Return, Taking Back and Disposal of Electrical and Electronic Equipment* and provides the **rights and obligations** that members must consent to adhere to with regards the recycling of the listed products the organisation is responsible for. A declaration is signed by members on joining the scheme. These members may comment on the annual review of the advance recycling fee. Convention signatories may also be on the SWICO Recycling Board, irrespective of company size or sector.

Those importers or manufacturers who choose not to pay the advance recycling fee to a private organisation are responsible for keeping records of products sold and products taken back, including how the products were disposed of. This must be done **at their own cost**. Usually this is **more expensive** than paying the advance recycling fee due to economies of scale.[89]

The Swiss Ordinance on the Disclosure of Prices requires the advance recycling fee to be **included in the retail price**.[90] It is not mandatory but is advisable that this be indicated so that consumers are aware that recycling of the product has already been paid for and the product will be properly disposed of once returned.[91]

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[85] Global Information Society Watch, *Focus on ICTs and environmental sustainability* (APC and Hivos, 2010)
[86] Md Tasbirul Islam et al, 'Comparison of E-Waste Management in Switzerland and Australia: A Qualitative Content Analysis' (2018) 12(10) *International Journal of Environmental and Ecological Engineering*
[87] Ibid
[88] http://www.swicorecycling.ch/en/administration/joining
[89] http://www.swicorecycling.ch/en/disposal/faq
[90] Md Tasbirul Islam et al, above n 87
[91] http://www.swicorecycling.ch/en/disposal/faq

Advantages of "User Pays - eWaste"

Producer Responsibility Organisations (PROs) can provide an effective **platform for interaction** between waste management authorities and members of the scheme, namely importers, manufacturers and retailers. Such schemes also provide the opportunity to **clearly define the roles** of each stakeholder.

Because of the small market in PICs and often a single point of entry for the import of products that will eventually be classified as eWaste, close **monitoring** of the system should be achievable. Such administrative processes would be factored in to the advance recycling fee.

The sharing of collection points with other types of eWaste will provide economies of scale.

Considerations of "User Pays - eWaste" in the context of PICs

The cost of disposing of eWaste compared to the fee charged as an advance recycling fee must be considered. By regulating a higher disposal fee, **participation and compliance** with the scheme is promoted. The advance recycling fee may require annual review to ensure the incentive to contribute to the recycling process is valid. For PICs, the advance recycling fee is likely to include transport from urban and remote areas, handling, storage and export.

Transparency of the financing, collection processes, calculation of recycling rates and tendering for contractors will contribute to the success of the Producer Responsibility Organisations. Compliance with **international trade** of eWaste can also be facilitated by these organisations.

Issues of c**ompetitiveness** can be avoided if the majority of importers and manufacturers sign up to the schemes. Alternately, it can be made **compulsory** that all importers and manufacturers participate and pay an advance recycling fee before a product can be put on the market in PICs. This would also eliminate the issue of free-riders who don't contribute to the scheme but who's products are returned to collection points.

4.3.1. User Pays: Bulky home appliances in Japan

Brief description and key funding mechanism

Home appliances that are bulky can be a significant challenge for local councils to manage. In Japan, the cost of 1) collection and transport and 2) the cost of recycling is the responsibility of private consumers and the businesses that use such appliances. This fee is paid at the time of disposal.

How "User Pays – bulky waste" works

Bulky waste appliances are regulated under the *Home Appliance Recycling Act*, which came into force in 2001. Appliances regulated include TVs, air conditioners, washing machines, driers, refrigerators and freezers.

Retailers are responsible for collecting the appliances from households and businesses if they sold the appliance to them, or **any used appliance** if a new appliance is purchased from the

retailer. The cost of this service is the basis of the first fee paid by consumers and is determined by the retailer.[92]

The retailer returns the bulky waste appliance to a collection point. In some cases, this is a post office, which is also where disposal dockets may be purchased.[93] These services are contracted to licensed operators. The cost of this transfer is included in the **first fee** paid by consumers. Local councils may also transfer bulky waste appliances to collection points at a cost determined by the council.[94]

The **importer or manufacturer** is responsible for the recycling of the product. The cost of recycling is the basis of the **second fee** paid by the consumer and is determined by the importer or manufacturer. Those that import or manufacture below a set volume may contract these services to organisations defined under the *Home Appliance Recycling Act.* The transporter must be licensed for carrying industrial waste. The fee charged by importers and manufacturers may not exceed the actual cost of recycling and includes the cost of transfer from the collection point to the recycling facility. The fees charged are **reviewed by the government**.[95]

The system is monitored through the use of a **multi-part disposal docket** the consumer purchases in order to dispose of the product. One part of the docket is retained by the consumer as proof of disposal. Collection points retain a second part of the docket which are used for monitoring purposes. Information on the docket is uploaded and made available to consumers for confirmation of correct disposal of their product. Recycling facilities report on the volume of products received and the volume of materials recycled.[96]

Articles not covered by the *Home Appliance Recycling Act* are regulated under the *Small Electrical and Electronic Equipment Recycling Act* (e.g. mobile phones, smaller electrical appliances) and the *Act on the Promotion of Effective Utilization of Resources* (e.g. computers and tablets). Local councils are responsible for dealing with these waste streams.[97] The *Containers and Packaging Recycling Law* regulates packaging.

The government has set targets for recycling facilities that stipulate the amount of recycled material to be recovered per type of appliance.

Advantages of "User Pays – bulky waste"

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[92] Hotta, et al, 2014. EPR-based Electronic Home Appliance Recycling System under Home Appliance Recycling Act of Japan

[93] Joanne Chong et al, *Product Stewardship Schemes in Asia: China, South Korea, Japan and Taiwan* (Australian Department of the Environment, Water, Heritage and the Arts, 2009)

[94] Yasuhiko Hotta et al, *EPR-based Electronic Home Appliance Recycling System under Home Appliance Recycling Act of Japan* (OECD, 2014) <https://www.oecd-ilibrary.org/environment/extended-producer-responsibility/recycling-of-electronic-home-appliances-in-japan_9789264256385-17-en>

[95] Ibid

[96] Joanne Chong et al, above n 93

[97] Yasuhiko Hotta et al, above n 94

The example of the Japanese scheme removes the entire cost of managing bulky waste appliances from local councils. In addition, the mandatory rate of recovered materials from different appliances would promote disassembly and the fee charged would make handling operations economically feasible. For some appliances, disassembly at remote collection points would assist the transport of components to recycling facilities or separate material collection points.

Considerations of "User Pays – bulky waste" in the context of PICs

In Japan, the cost of recycling bulky waste appliances was initially set up as a single fee for all types of regulated appliances. Due to consumer dissatisfaction, this was amended to a variable rate based on the size of the appliances. Over the years, the recycling fee has mostly decreased.

In the Pacific region, the use of bulky household appliances is likely to increase in rural and remote areas as these regions become electrified.[98] A national flat rate may disadvantage urban consumers if the fee results in these consumers subsidizing disposal costs for remote consumers, particularly those on islands. It may therefore be necessary to consider subsidizing the cost of transport from collection points in remote areas to the importer or manufacturer, possibly through reverse distribution or backhauling practices. This payment option may be appropriate for large hotels and resorts where bulky appliances, such as televisions and fridges, are provided in each room.

The issue of illegal dumping of bulky waste is a concern in PICs. Making the consumer responsible for both fees may exacerbate the problem. However, the concept of separating the costs between the collection and recycling sectors may be worth considering. The responsibility and cost of transport from the consumer to the collection point may be financed through reverse distribution where a deposit is charged to the distributor prior to delivery to the consumer. This fee is returned to the distributor on disposal at the collection point. The cost of transport from the collection point and recycling could be financed through a levy charged to the importer or manufacturer. A combination of these models, including an advance disposal fee paid by consumers, may be necessary for each sector and may assist in accommodating the different costs for urban and remote locations.

4.4. Discussion

Ecologically sustainable development is a broad principle that has been described as a mechanism for internalising the external environmental costs by:

- Including environmental factors in the valuation of assets and services,
- Adopting the polluter pays or user pays principle, i.e. the costs of containment, avoidance and abatement should be the responsibility of those who generate pollution and waste, and

[98] Pacific Region Infrastructure Facility (PRIF), *Pacific Region: Solid Waste Management and Recycling. Pacific Country Profiles* (2018) <https://www.theprif.org/documents/regional/urban-development-waste-management/pacific-region-solid-waste-management-and>

- Basing the purchase price on the costs of the full life cycle of providing the purchased goods and services, including the use of natural resources and assets and the end-of-life treatment of waste generated.[99]

Funding of waste management in Solomon Islands and Vanuatu predominantly falls to the public sector. A visitor levy presents a simple option for partially funding waste management and piloting various schemes, such as composting programs. Such a levy is under consideration in Vanuatu but it is unclear what portion may be dedicated to improving waste management.

A licensing scheme such as the Green Dot scheme may be a feasible option in the Pacific region that would be relatively easy to implement and manage. As for the Green Dot scheme, the collection of wastes could be funded for appropriate products.

Because of the socio-economic conditions in most PICs it is unlikely that holding the consumer responsible for the full costs of collection and recycling is feasible as illustrated in the example of Japan's bulky appliances. This may lead to an increase in illegal dumping. However, it may be possible to transfer a small portion of these costs to the consumer within the purchase prices of some products as outlined in the example of Switzerland's eWaste scheme.

[99] Hon. Justice Brian J Preston, above n 71

5. BEST PRACTICES FOR IMPORTED USED PRODUCTS

5.1. Objective of the study

This study aims to *review best practices to minimise waste arising from imported used products.* The Pacific Island Countries rely heavily on imported products. This limits the ability of PICs to influence the design of products produced in other countries. Chapter 4 – Polluter Pays has provided some examples for consideration to assist in funding the management of all waste products through the principles of polluter pays and user pays. Chapter 6 – Extended Producer Responsibility provides options for consideration that aim to incentivize design changes, as per the principles of Extended Producer Responsibility and Product Stewardship.

Chapter 3 – Integrated Waste Management, Table 2 summarises the measures included in regional instruments that promote the use of best practices regarding waste management. This may be explicit or inferred, mandatory of voluntary. Table 4 and Table 5 of Chapter 3 also summarise the adoption of the polluter pays principle within the national instruments of Solomon Islands and Vanuatu.

Waste generated from the consumption of imported products is likely to be co-mingled with waste resulting from the production and consumption of locally produced products. The best practices presented in this study will therefore naturally overlap for both categories of products.

5.2. Defining best practices

Best Practice generally refers to methods or techniques used by business or industry that consistently and reliably result in the desired outcomes. Current programmes underway in Solomon Islands and Vanuatu include best practices for landfill management and treatment of medical waste.

This study focuses on a broader range of best practices that are not necessarily legislated, but that assist in achieving a 3R approach. Although a 4R approach has been adopted in the Solomon Islands (Refuse, Reduce, Reuse, Recycle), this study does not address public awareness campaigns that move the consumer towards the first R of Refuse. Equally, the option of replacement is not considered here as suggested replacements would require a full lifecycle assessment to ensure issues are not transferred from one material to another. This adopts the approach of Victor Tuch Gonzáles, the municipal planning director of the Guatemalan city of San Pedro La Laguna who aptly summed up the concept in the sentence “You don’t need a straw for beer, so why use one for soda?”

Established programmes are outlined, as well as more progressive initiatives that are appropriate in the context of PICs. These practices may require integration of efforts by government, industry and individuals but are focused on achieving the 3R hierarchy of waste management, predominantly through a voluntary approach. The underlying objective is to reduce the cost burden on authorities responsible for the environmentally sustainable management of waste.

The best practice examples presented have been selected for their relevance in the Pacific context. These apply to the growing issue of mobile device waste, particularly in regions where electrification projects will provide greater access to such devices. MobileMuster is an program that has proved successful in Australia and potentially replicable in PICs. Because of the costs and challenges of transporting waste from remote communities, three examples are provided to reduce the need for additional transportation. As a temporary mechanism, Ecobricks makes use of packaging waste in-situ and reduces the need for additional transportation. The Australian example of backloading provides a technology-based mechanism for making use of existing transport models. The Gringgo example provides a further example of technology through a phone application that has successfully changed the transport model in Indonesia to reduce the cost of transport and increase the income of communities. In all countries, however, improvement in inter-ministerial cooperation will improve engagement of all relevant ministries to ensure integrated waste management is achieved. The United States provides a rare example of legislated cooperation.

5.1. Examples of best practices for waste minimization from imported used products

5.1.1. Mobile phones: MobileMuster, Australia

Brief description

The MobileMuster program was established by the mobile phone industry of Australia. The mobile network carriers and manufacturers of handsets jointly and voluntarily fund the program to collect and recycle mobile devices (phones, tablets, charging cords, etc.) easily and free of charge. The program also educates on the importance of recycling.

How does "best practice – mobile phones" work?

Infrastructure

MobileMuster operates at the Recycle and Reuse phase of the supply chain, functioning as the mobile phone industry's recycling program.[100] It is accredited under the *Product Stewardship Act 2011.* Australia has thus taken a combined management approach for certain products and materials, sharing the responsibility to reduce the impact of these products and material on the environment and human health and safety. This applies to those involved in the producing, selling, using and disposing of certain products and materials.

MobileMuster operates as a voluntary product stewardship program in which relevant sectors cooperate to regulate the health, safety, and environmental impact of their products through a collaborative arrangement. These arrangements are initiated, led and funded by industry in lieu of government-created regulations.[101] Additionally, the arrangement can seek accreditation for the arrangements from the government for a period of five years. The accreditation process is conducted by the Department of Environment and Energy and

[100] Australian Government - Department of Environment and Energy, *Voluntary product stewardship - accreditation of arrangements* (2018) <http://www.environment.gov.au/system/files/resources/93e66efc-354c-4df1-b72b-cb620c808e2b/files/vps-accreditation-arrangements-fs.pdf>

[101] http://www.environment.gov.au/protection/waste-resource-recovery/product-stewardship

involves due diligence assessments, using legislation and quality criteria to assess the probability of success of the arrangement.[102] Once approved as an accredited arrangement, annual reports must be submitted by the scheme, which are published.[103] Some of the arrangements collect funds to pay for the establishment and operation of the arrangement, associated education programs, research and various activities. To collect funds, arrangements need approval from the Australian Competition and Consumer Commission.[104]

The program is administered by the Australia Mobile Telecommunications Association (AMTA) on behalf of the mobile phone carriers.[105] MobileMuster has a corporate structure in which the work plan, budget and program targets are approved by the Recycling Committee and the AMTA Board.[106]

The method by which the manufacturers and mobile network carriers jointly share the cost of the arrangement is two-fold. For the manufacturers, their contribution is calculated by dividing the participating manufacturer shipments by the industry imports.[107] Currently, the handset manufacturers include Microsoft, Samsung, Motorola, HTC, Huawei, ZTE, Alcatel, Oppo, HMD Global, and GoogleMobile Network. For the mobile network carriers, their contribution is based on their total market share by revenue. Currently, the network carriers include Telstra, Optus, Vodafone Hutchinson Australia and Virgin Mobile, a mobile virtual network operator. The financial arrangement has led to manufacturers and carriers paying AU 0.30c and AU 0.12c respectively per handset shipped into Australia.[108]

Operations

MobileMuster collects and dismantles mobile devices into their component pieces, thus creating less waste by reducing the need to source new material.[109] By transporting and recycling the devices, MobileMuster removes the hurdles of collection, transportation and processing from the consumers, as well as the manufacturing companies interested in using recycled materials. Once sorted and dismantled by the primary recycler, the components are sent either to third party specialist recyclers for further processing or manufacturers for reuse instead of being sent to the landfill.[110]

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[102] http://www.environment.gov.au/protection/waste-resource-recovery/product-stewardship/voluntary-product-stewardship/accreditation

[103] http://www.environment.gov.au/protection/waste-resource-recovery/product-stewardship/voluntary-product-stewardship/accredited-arrangements

[104] http://www.environment.gov.au/protection/waste-resource-recovery/product-stewardship/voluntary-product-stewardship

[105] MobileMuster, *2018 Annual Report* (2018) <https://www.mobilemuster.com.au/wp-content/uploads/2018/11/MOB_AnnualReport2018_AMEND02.WEB_.pdf>

[106] MobileMuster, *2017 Annual Report, Appendix* (2017) <http://www.environment.gov.au/system/files/pages/11109e41-0116-46e9-bcad-1fa4f21a1258/files/mobilemuster-annual-report-2017-appendix.pdf> (pg 8)

[107] Ibid (pg 6)

[108] Ibid (pg 8).

[109] https://www.mobilemuster.com.au/about-us/

[110] MobileMuster, above n 106 (pg6)

For collection purposes, MobileMuster uses existing networks of local councils, mobile phone retailers, and Australia Post offices coupled with partnerships developed with other retailers, workplaces, schools, and repair stores or service centres.[111] Through this vast network, MobileMuster is able to collect relevant eWaste from across Australia. In past years, particular recycling processes could not be performed to international standards in Australia and these components were exported for further processing. Recent innovation in the recycling industry of Australia has meant MobileMuster is able to recycle mobile batteries in-country through a partnership with a Melbourne-based recycling facility.[112]

Results of "best practice – mobile phones"

In 2018, MobileMuster recycled 1.2 million smartphones and batteries.

Advantages of "best practice – mobile phones"

The inclusion of network carriers in the funding of the scheme provides additional income to sustain the scheme.

Considerations of "best practice – mobile phones" in the context of PICs

Although this model has worked well for Australia, replication within PICs may present a challenge due to transportation as well as processing of components. In the short term, collected mobile devices would need to be transported to a regional storage facility, particularly in Solomon Islands where eWaste facilities may not be as widely distributed.[113] In addition, there are currently no mobile device manufacturers in the Solomon Islands or Vanuatu to purchase the reusable components salvaged from the mobile devices. However, this challenge could present a business opportunity for a local business, either through manufacture or export.

5.1.2. Reducing the need to transport waste: in-situ use of waste & Ecobricks

Brief description

Ecobricks are a low-cost method of recycling that makes us of plastic waste as a building material. Smaller and flexible plastic waste is densely packed into larger, more rigid plastic containers and used to substitute building materials such as cement blocks.

How does "in-situ use of waste" work?

Plastic waste is increasingly being repurposed as building material. This ranges from the simpler applications such as Ecobricks and the bottle houses of Nigeria to the complex solution of melting plastic waste to create brick substitutes. In its simplest form, Ecobricks uses plastic bottles are filled and densely packed with smaller plastic garbage such as single use plastic bags or plastic wrappers.[114] This model has been used in various locations such as the Philippines, Indonesia, U.S.A. and Nicaragua. In Nigeria, plastic bottles are filled with

[111] MobileMuster, above n 105 (pg 13)
[112] Ibid (pg 14)
[113] Pacific Reef Savers Ltd, above n 25; http://honiaracitycouncil.com/index.php/rubbish-collection/
[114] https://www.ecobricks.org/

sand,[115] which are stacked and set in place with a mud or cement mixture as per traditional construction. In more sophisticated applications, plastic waste is shredded, melted and moulded to form interlocked blocks, cylinder blocks or other shapes used for construction. Plastic waste can also be combined with cement, such as the Ecoblocks created by Grupo PEDREGAL in Costa Rica.[116]

The collection of plastic waste and the building of Ecobricks is promoted through school education material and guidelines that can be downloaded. The link between consumption of junk food and plastic wrapper waste is made clear. The guidelines help raise awareness while providing useful materials to the community. Different designs are provided in the guidelines, as well as recommended minimum standards to improve durability. A web app at www.gobrik.com helps communities track their progress and promotes logging each Ecobrick's information including weight, serial number, date and name of creator.

Figure 3: Ecobricks in use in Indonesia[117]

Results of "in-situ use of waste"

In Indonesia, Ibu Sofi was stockpiling 40 kilograms of plastic waste in her basement to prevent the pollution of local waterways when she learned about Ecobricks. Since she and her community started making Ecobricks, they have reduced their plastic waste to zero and have been able to use the Ecobricks in various ways, including as furniture.[118]

In the Philippines, Jane Manung used to either bury or burn her waste in the forest area until she discovered Ecobricks. Jane now collects plastic from the stores of her town after work each day, thereby reducing her own waste production to zero as well as minimizing the impact on the environment from plastic waste generated by those stores. Jane aims to create one Ecobrick a day. Using the Ecobricks method of recycling, Jane was able to make enough bricks to rehabilitate her house using Ecobricks and local, traditional plastering materials. As a result of this, her house became a town attraction.[119]

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[115] http://www.gidiarchitect.com/2017/08/nigerias-eco-friendly-plastic-bottle.html; https://www.bbc.com/news/world-africa-14722179;

[116] There is currently no method to recycle the plastic waste integrated into these cement blocks.

[117] https://www.ecobricks.org/

[118] https://www.ecobricks.org/ibu-sofi/

[119] https://www.ecobricks.org/happy-new-year-from-janes-clay-bottle-house-in-besao/

Advantages of "in-situ use of waste"

Creating Ecobricks does not require any special skills or tools. In the short term until transport options are available for plastic waste, there likely to be a steady supply of material with which to work. Furthermore, once created, the Ecobricks can be reused multiple times for different projects. Using Ecobricks instead of traditional building materials reduces the need to deplete forests, reefs and other surrounding resources or transport materials from other locations. The costs of construction may therefore be reduced. As a result of the ease of making and using the Ecobricks, communities have full autonomy to control the plastic waste found in their environment.

Considerations of "in-situ use of waste" in the context of PICs

Notwithstanding the advantages of Ecobricks, depending on how they are used in construction, the "bricks" can cause unintended health and environment problems. Plastic photodegrades in the sun, but such degradation is not visible to the human eye. Therefore, if the "bricks" are not completely covered by the binding material, it could leach garbage and toxin through the constructed building.[120] These design recommendations are provided in the downloadable Ecobrick construction manual. In addition, extreme weather events may result in Ecobricks entering the marine environment. This practice should only be used as an interim approach while regional collection and recycling options are explored.

5.1.3. Reducing the cost of transport: backloading of waste and recyclables

Brief description

Loadlink is a mobile app which connects freight in need of transport with truck drivers willing to transport it, covering the entire Australian continent. By connecting drivers to the freight, Loadlink minimizes the number of empty decks between driver appointments.

How does "backloading" work?

Loadlink provides a simple, mobile-based platform which connects truck drivers and freight. Through the platform, a person or entity with freight simply inputs their details such as location, contact information and the dimensions of your freight as a listing on the platform. Once live, the listing is visible to the member network of truck drivers because only members of the network are able to see the contact information. The truck driver members are then able to contact the creator of the listing to negotiate the terms of the transportation. The listing creator can interview and negotiate with various truck drivers until a match is found. Loadlink does not set a rate and is not involved in the negotiation process. It is simply a secure and easily accessible platform by which interested parties can contact each other.[121]

Loadlink does not charge those wanting services to use the platform. However, the truck driver members are charged a monthly fee.[122] The monthly fee for members is AUD 35.00 or,

[120] https://www.iol.co.za/capetimes/opinion/ecobrick-project-not-part-of-realistic-solution-for-plastic-poser-10317694

[121] http://loadlink.com.au/

[122] http://loadlink.com.au/; Currently there are no member fees until 28/02/2019.

alternatively, AUD 100 for three months. At these prices, the drivers are able to increase their income for less than AUD 1.50 per day.[123]

As it currently operates, Loadlink makes finding and transporting freight a convenient and easy experience for individuals looking for transport. By listing their needs on the portal, the individual is able to potentially access over 150 transport operators with whom he or she can negotiate an agreement to transport their freight. For the transport operators, Loadlink provides an opportunity to earn more income at no inconvenience to them and for a nominal participation fee.

Results of "backloading"

Currently, Loadlink has a network of 179 truck drivers and 207 loads.[124]

Advantages of "backloading"

For some areas, transport costs prohibit movement of goods. However, an opportunity exists to create relationships between communities and trucking or shipping companies where backloading on empty supply trucks and barges could supply transport and financial benefits to both parties.[125]

Considerations of "backloading" in the context of PICs

Similar arrangements have been used to transport waste by backloading in the Northern areas of Australia and the Torres Strait.[126] In this region, local processing programs have overcome logistical constraints (such as limited capacity, lack of appropriate infrastructure and high transport costs) of waste recovery in remote locations by backloading recyclable waste onto routine delivery trucks and barges for return to regional centres.[127] Where regular ferry services or truck deliveries operate, it may be possible to engage these operators to participate in backloading of cleaned and compacted bales of waste to regional collection points, which in turn could engage similar backloading services to central recycling centres. The feasibility of a fee for services provided would need to be investigated based on the potential for resale of the waste products and the volume of bales to be transported.

5.1.4. Changing the transport model: technology-based waste transport

Brief Description

Gringgo is a phone app developed in Indonesia to facilitate garbage collection services. The app also provides educational information to the public.[128] Through mobile technology, individuals, households or businesses are able to locate waste disposal sites, recycling facilities, or connect with trash collectors to dispose of their waste and, in some cases, earn money in the process.

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[123] http://loadlink.com.au/
[124] http://loadlink.com.au/
[125] https://www.tangaroablue.org/resources/cape-york-management-plan.html (pg 29)
[126] http://www.nespnorthern.edu.au/wp-content/uploads/2017/07/Waste-marine-debris-final-report.pdf (pg 31)
[127] https://www.tangaroablue.org/resources/cape-york-management-plan.html (pg 22)
[128] https://www.youtube.com/watch?v=deCeD6FaukE; https://www.gringgo.co/end-ocean-plastic-now

How does "technology-based waste transport" work?

Indonesia experiences a wide range of challenges with regards waste management, much of which is comprised of plastic pollution.[129] Indonesia is reported to be the second largest plastic polluter after China.[130] The problem is exacerbated by the minimal to non-existent waste management infrastructure in many parts of the country coupled with historical behaviour of disposing of garbage in waterways.[131]

In its previous iteration – CashforTrash - the primary aim was to change the mindset of schoolchildren towards recycling by making it fun and rewarding using a mobile app.[132] The model allowed the CashforTrash team to interface with schools through presentations and recruit students to earn money for collecting and recycling.[133] Using the app, the students created accounts through which they were paid and their collections were tracked. Once the students collected the garbage, CashforTrash collects the garbage from the schools, sorts the garbage and uploads data by weight for each account. CashforTrash transports the garbage to its recycling partners who process and pay for the garbage. These funds were used by CashforTrash to pay the students.[134] Through the experiences of CashforTrash, the team recognized that the model of engaging collectors through a mobile app could serve the wider population, including those in remote areas.

Gringgo (previously CashforTrash) addresses the problem of plastic waste in two distinct ways. Through its mobile platform, Gringgo educates the population about the available options for waste management – removal, recycling, or selling. Once a person, household or business downloads the app, they are provided with various options to dispose of their waste. For example, if a person or a household decides to dispose of their waste, the Gringgo app teaches that waste is more valuable if separated into categories like organic, recyclables and other waste.[135]

Gringgo then makes use of the existing, informal garbage management system and organizes it into a network that is accessible to the public through its easy to use mobile application.[136] Individuals can take their sorted garbage to the sites listed on the app or sell it directly to the recycling facilities themselves. In addition, individuals can negotiate a rate for a garbage collector to transport the garbage on their behalf.[137] As a result of a vast transport network

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[129] http://www.atimes.com/article/indonesia-awash-in-a-sea-of-plastic-waste/

[130] Jambeck, J. R. et al, 'Plastic waste inputs from land into the ocean' (2015) 347(6223) *Science (New York, N.Y.)* 768-771

[131] https://www.shell.co.id/en_id/sustainability/communities/from-trash-to-cash.html; https://jakartaglobe.id/features/indonesians-can-earn-cash-giving-trash/; https://oceanconservancy.org/blog/2015/10/06/recycling-bali-style/

[132] https://gringgo.co/about

[133] https://www.youtube.com/watch?v=RLKw6EE2rOM

[134] Id.

[135] https://www.youtube.com/watch?v=deCeD6FaukE

[136] https://www.youtube.com/watch?v=8Ajjw4XD18Y

[137] https://www.youtube.com/watch?v=deCeD6FaukE

of garbage collectors, Gringgo is able to provide their services across many areas, thus increasing revenue for the existing garbage operators, particularly the informal sector.

In the case of some Indonesian cities, the city government commits to purchasing the rubbish at set prices displayed at the local waste banks, ensuring price stability for those delivering trash. The waste banks then sell the waste on to waste merchants, who ship it to plastic and paper mills on the main island of Java.[138]

Results of "technology-based waste transport"

Throughout the pilot phase of the project, the waste collection increased per month by 199%. The waste recycled also increased by 33%.[139] As a result of this project, the income of the waste collectors also increased, specifically in customer fees and the sales of recyclables. The increase in customers paying fees is likely due to the increase in the number of households served, which grew from 712 to 924 within approximately two years.[140]

Advantages of "technology-based waste transport"

The Gringgo model has the potential to greatly increase collection in areas that have no waste collection services. It removes the need for new services to be provided in the traditional scheduled collection model. Instead, a new waste collection service can operate in an on-demand model by putting individuals in direct contact with garbage operators who collect waste once a suitable amount has been aggregated. In some cases, the need for the 'middle man' is removed, allowing individuals to sell their waste direct to recycling organisations.

Considerations of "technology-based waste transport" in the context of PICs

The use of mobile phones is increasing within the urban and remote communities of PICs. The Gringgo model can be adapted to remote communities where it is difficult to disseminate awareness of new options for waste management and educate dispersed communities on how to dispose of waste appropriately. A mobile app could also put individuals in contact with transporters participating in a backloading scheme, as outlined in section 5.1.3.

5.1.5. Inter-ministerial cooperation: legislated participation of ministries

Brief Description

Marine debris is a symptom of failures in the governance of waste management. In the United States of America, the establishment of a single national committee to address the issue was legislated by the *Marine Debris Research, Prevention, and Reduction Act*. The Interagency Marine Debris Coordinating Committee (IMDCC) was therefore formed in 2006.[141] The government agencies that must participate in this committee are also legislated. The committee reports to the Federal Government.

How does "legislated inter-ministerial cooperation" work?

[138] https://www.straitstimes.com/asia/se-asia/indonesias-poor-benefit-from-cash-for-trash-scheme
[139] Gringgo presentation, pg 11 (APEC Marine Debris Stakeholder Meeting, Bali, Indonesia November 2018).
[140] Gringgo presentation, pg 13-14 (APEC Marine Debris Stakeholder Meeting, Bali, Indonesia November 2018).
[141] https://marinedebris.noaa.gov/IMDCC

Waste management can span the mandate of a number of government agencies. Good governance is therefore greatly enhanced by the cooperation of these ministries to allow for integration of efforts in achieving national and regional goals.

In 2016, a coordinating committee was established in Vanuatu to address the issues of waste management. The aim was to improve coordination from national government down to the provincial and municipality level and include the private sector and communities.[142]

Solomon Islands aims to establish a waste and pollution control unit to assist in developing national standards and protocols for waste segregation, collection and disposal, as well as guidelines for eWaste management. In addition, each province should work with the lead agencies at the national level to establish effective waste collection, transfer systems and disposal sites. Local innovation of waste management and pollution control should also be encouraged through this forum.[143]

The US *Marine Debris Research, Prevention, and Reduction Act* has since been replaced. The *Save our Seas Act of 2018* (Public Law No: 115-265) came into effect in 2018. This Act reauthorised the *Marine Debris Act* for the following four years.[144] The Interagency Marine Debris Coordinating Committee (IMDCC) was also reauthorised by the *Marine Debris Research, Prevention, and Reduction Act.*

Importantly, federal entities are legislated to participate in the IMDCC and report biennially to Congress on achievements as well as recommendations.[145] These reports are publicly available online. The IMDCC is made up of the following agencies:

- Department of Commerce, National Oceanic and Atmospheric Administration (NOAA),
- U.S. Environmental Protection Agency (EPA),
- Department of Defense, U.S. Army Corps of Engineers,
- Department of Defense, U.S. Navy,
- Department of Homeland Security, U.S. Coast Guard,
- Department of the Interior, Bureau of Safety and Environmental Enforcement,
- Department of the Interior, National Park Service,
- Department of the Interior, U.S. Fish and Wildlife Service,
- Department of Justice, Environment and Natural Resources Division,
- Department of State, Office of Ocean and Polar Affairs, and
- Marine Mammal Commission.

The latest revision of the *Save Our Seas Act 2018* includes an authorisation for the US to engage in international efforts to reduce marine debris.

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[142] Government of Vanuatu - Department of Environmental Protection and Conservation (DEPC), above n 7
[143] Solomon Islands Government - Ministry of Environment, C. C., Disaster Management and Meteorology,, *Solomon Islands : waste management and pollution control strategy 2017-2026* (SPREP, 2017)
[144] https://www.congress.gov/bill/115th-congress/senate-bill/3508/text
[145] https://marinedebris.noaa.gov/IMDCC

Advantages of "legislated inter-ministerial cooperation"

Other government agencies may attend the IMDCC meetings. However, by mandating the agencies that must participate, a minimum level of coordination is ensured. These agencies must agree on the necessary regulations, monitoring, research and awareness required to meet national objectives.

Considerations of "legislated inter-ministerial cooperation" in the context of PICs

The US IMDCC serves as an example for a single authority to deal with waste management in Solomon Islands and Vanuatu. It merits consideration that the committee established in Vanuatu and suggested in Solomon Islands be similarly legislated to ensure continuity and regular participation by key agencies. Such measures can also lead to dedicated funding to assist in collaborative efforts to meet the recommendations made by the committee and agreed to by ministers. It may not be necessary to legislated involvement in international efforts to combat marine litter and improve waste management.

5.2. Discussion

Industry best practice extends to the reduction of waste generated throughout the lifecycle of the products and services produced. Through consultation with local industries in Solomon Islands and Vanuatu, as well as importers of products, it may be possible to gain voluntary contributions for the collection and recycling of their products. To prevent free-riders, however, will require transparent and fair spread of these contributions. This is likely to lead to a scheme run by industry, as for the MobileMuster program in Australia, or by government. In the case of mobile phones, it may be possible to encourage voluntary participation of the mobile phone industry in combination with a low fee user-pays scheme but a co-regulatory EPR scheme is more likely to have success.

As illustrated in this section, transport costs can be reduced by 1) reducing the need to transport waste, 2) reducing the cost of transport, and 3) rethinking the traditional waste collection transport model. Such strategies would reduce the need to expand existing transport models which would increase the reliance on imported diesel.

Where waste can be used in-situ for other uses, such as building material, that waste will not need to be transported out of the area. In addition, the need to transport raw materials into the area will be reduced. Finding alternate options for repurposing such waste would be an interim solution while funding mechanisms are developed for remote transport of waste or programs to reduce the generation of waste in these regions.

Backloading is an option that could be investigated and piloted in the short-term. The fee paid to truck drivers would need to be balanced with the resale value of the wastes transported. Local shredding and baling equipment may also be necessary. Where a small number of truck drivers operate, it may be possible to establish a local network that can negotiate prices via text or negotiate fixed prices and routes on a more regular schedule.

Mobile phone apps are increasingly being used to connect informal or small-scale waste collectors in direct contact with recycling facilities. This on-demand method of collecting

waste should be investigated in the short-term in areas where facilities exist within feasible distance to store and process the waste. In the longer-term, the on-demand method could be combined with backloading, once waste is collected and processed in more remote regions.

Key to the success of any integrated waste management strategy is inter-ministerial cooperation. Vanuatu has established a national waste committee and Solomon Islands has listed such a committee as a goal. The example of the Marine Debris Coordinating Committee in the United States provides an option for ensuring the long-term sustainability and effectiveness of these committees. Legislating the existence of the committee, the ministries that must attend meetings and the reporting obligations of the waste committees would provide a solid foundation for integrated waste management in all PICs.

6. EXTENDED PRODUCER RESPONSIBILITY PROGRAMMES

6.1. Objective of the study

This study aims to *review practical options for extended producer responsibility programmes (including compliance options) for the product life-cycle of imported products, packaging waste and bulky waste.*

Chapter 3 – Integrated Waste Management, Table 3 summarises the measures included in regional instruments that promote the use of the principle of Extended Producer Responsibility regarding waste management. This may be explicit or inferred, mandatory of voluntary. Table 4 and Table 5 of Chapter 3 also summarise the adoption of the principle of extended producer responsibility within the national instruments of Solomon Islands and Vanuatu.

This study provides a review of selected extended producer responsibility programs for consideration within Solomon Islands and Vanuatu waste management strategies.

6.2. Defining extended producer responsibility

Extended Producer Responsibility (EPR) is describes as:

> *"a mandatory type of product stewardship that includes, at a minimum, the requirement that the manufacturer's responsibility for its product extends to post-consumer management of that product and its packaging. There are two related features of EPR policy: (1) shifting financial and management responsibility, with government oversight, upstream to the manufacturer and away from the public sector; and (2) providing incentives to manufacturers to incorporate environmental considerations into the design of their products and packaging."*[146]

As mentioned in Chapter 4 – Polluter Pays, the principle of EPR is an extension of the Polluter Pays principle, extending the duty of those supplying a product to contribute to the cost of collection and end-of-life treatment to mandating that the design of a product take into account the processes involved in such post-consumer handling and treatment.[147]

Further to this, the principle of Product stewardship is described as "*the act of minimizing the health, safety, environmental, and social impacts of a product and its packaging throughout all lifecycle stages, while also maximizing economic benefits. The manufacturer, or producer, of the product has the greatest ability to minimize adverse impacts, but other stakeholders, such as suppliers, retailers, and consumers, also play a role. Stewardship can be either voluntary or required by law.*"[148]

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[146] https://www.productstewardship.us
[147] Hon. Justice Brian J Preston, above n 71
[148] https://www.productstewardship.us

As per the Pacific Regional Waste and Pollution Management Strategy 216-2025, Principle 2 promotes Product Stewardship as:

> *"Those involved in producing, importing, selling, using and disposing of products have a shared responsibility to ensure that those products or materials are managed throughout their lifecycle in a way that reduces their impact on the environment and on human health and safety."*

6.3. Examples of extended producer responsibility programmes

A common implementation practice within extended producer responsibility and product stewardship schemes is to establish a co-regulatory Producer Responsibility Organization (PRO). These organisations will manage the operation of the post-consumer product take-back scheme on behalf of industry members with regards collection and recycling. This can be done in conjunction with local councils. The PRO will also ensure the industry members are in compliance with legislation as detailed in regulations, usually relating to targets and reporting requirements. In most cases, guidelines are provided to assist in the design of products and reporting is verified be external auditors before submitting to government authorities. PROs are accredited and monitored by government. A few schemes employ government-administered funds.

The examples of extended producer responsibility programmes presented have been selected for their potential application in the context of PICs. The recycling fund in Taiwan was initiated at a time when funding for waste management was limited. Over time, this mechanism has become increasingly based on technology, which has also reduced the overall costs of implementation. The Chilean example of the advance disposal/recycling fee provides as a more recent program adopted in a developing country with limited funds for waste management. The Australian Packaging Covenant provides an example of a co-regulatory framework for the collection and end-of-life treatment of packaging waste, where industry and government work together. The Canadian battery recycling program provides a deposit mechanism that is not passed on to the consumer and could assist PICs in covering the costs of transporting similar types of wastes from remote communities.

6.3.1. Recycling fund: Taiwan

Brief description and key funding mechanism

Producers (manufactures and importers) are made financially responsible for those products they place on the market that are regulated by legislation. A fee is paid to a government-administered fund, which pays for municipal collection services and subsidises recycling processes. The community are also paid to deliver recyclable waste to collection points.

How does the "recycling fund" work?

In Taiwan, the Polluter Pays principle is enacted through the *Waste Disposal Act 1988.* Prior to this, collection of recyclables was low and uncoordinated.[149] Producers pay a **fixed fee** to

[149] United States Environmental Protection Agency (EPA), *Recycling and Waste Electrical and Electronic Equipment Management in Taiwan: A Case Study* (2012)

a **dedicated Recycling Fund** based on the number of units or volume sold in Taiwan and determined by the costs to collect and recycle the product. The fees payable to the Recycling Fund are **calculated by a committee** and are specified per item or volume. Fees are not applicable to products exported from Taiwan (fees paid are reimbursed if the product is exported).[150] The Environmental Protection Administration Taiwan (EPAT) manages the Recycling Fund Management Board (RFMB) which is responsible for the operations of the Recycling Fund.[151]

Municipal services collect household and small business waste. Collection points are also maintained at some retail outlets. **Registered recyclers are subsidised** through the Recycling Fund to take physical responsibility for the regulated items. Recyclers registered with the scheme are not certified, but must comply with regulations.[152]

Recycling **targets are not set**. Instead, the number of units recycled are monitored and a certain fluctuation above or below the achievements of the previous year are investigated.

The Recycling Fund is divided into **multiple special funds** for regulated products. It is used for subsidising registered recyclers, funding municipal collection services for regulated recyclables, providing grants for municipalities and community groups and the auditing of collectors and those recyclers subsidised by the Fund. Other uses of funds, such as education and storage facilities, may also be approved if relating to the recycling of regulated products and materials.

Members of the community are **compensated by the recyclers** for taking items to designated collection points. Education and community groups have fostered a strong culture of participation by the public, including the separation of waste into organic, recyclable and non-recyclable wastes. Together with the recyclers, local authorities and the Recycling Fund, the community makes up the so-called 4-in-1 Recycling Program.

The *Waste Disposal Act 1988* has been amended over the years to update the list of Regulated Recyclable Articles. The list currently includes:

- Dry batteries,
- Lead-acid batteries,
- Motor vehicles,
- Tires,
- IT equipment (portable computers, motherboards, hard drives, power supplies, computer cases, monitors, keyboards, printers),
- Light sources (various bulbs, tubes, lamps),
- Flat containers (including boxes, lids, plates, trays, fast food containers, disposable tableware),

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<https://19january2017snapshot.epa.gov/international-cooperation/case-study-taiwans-e-waste-management-system_.html>

[150] https://recycle.epa.gov.tw/en/index.html

[151] United States Environmental Protection Agency (EPA), above n 149

[152] Ibid149

- Non-flat disposable tableware,
- Various containers (including metal, aluminium, glass, tetra Pak, paper, paper tableware, PET, PE, polystyrene, PSfoam, PS non-foam, PVC, PP, other plastics, pesticide containers).[153]

Manufacturers and importers must apply the government's **recycling logo**,[154] install collection facilities and must take back regulated recyclables at the end of life.[155] An online reporting tool for all those involved in the 4-in-1 Program is also available. Recovered items that are **repaired and resold** or components that are sold for **reuse** are **not included in recycled volumes** reported.

Appliance retailers are required to take back used appliances from consumers purchasing new appliances at **no charge**. The used appliances are then shipped to the local council or to registered collectors or recyclers.[156]

To prevent illegal dumping of wastes, all garbage trucks require a **permit** and must have a **GPS tracking system** installed. This transmits the movements of the garbage truck to an online reporting system. This online system also allows for the reporting of illegal dumpsites. Heavy penalties are legislated for infringements. In addition, the auditing and certification regulations require recyclers to maintain CCTV monitoring systems that record their daily operations.[157]

A "**Green Differential Fee Rate**" was introduced which encouraged the use of environmentally-friendly design. The discounted rate was initially 30% of the standard rate but in 2015 this was reduced to a 15% discount. A **green logo** is displayed on products that meet multiple "green" criteria. The differential fee also allows for **increased rates** for products that don't meet environmentally-friendly criteria. Such criteria can include energy and water efficiencies.[158]

Results of the "recycling fund"

The combination of pay-as-you-throw and EPR schemes has assisted Taiwan to reduce the generation of waste, incinerate less and create a viable recycling system. The government has cited an increase in collection rates of waste containers from 38.1% in 2001 to 73.65% in 2015. Some years have been as high as 78%.[159]

Advantages of the "recycling fund"

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[153] See https://recycle.epa.gov.tw/en/index.html for a full listing of regulated waste containers
[154] United States Environmental Protection Agency (EPA), *Recycling Regulations in Taiwan and the 4-in-1 Recycling Program (Handout for Workshop Materials on WEEE Management in Taiwan, October 2012)* (2012) <https://www.epa.gov/sites/production/files/2014-05/.../handout-1a-regulations.pdf>
[155] Art. 19
[156] https://recycle.epa.gov.tw/en/index.html
[157] https://waste-management-world.com/a/smmart-waste-management-pays-off-in-taiwan
[158] Ma, H.-K., 'E-waste Recycling in Taiwan' (Paper presented at the Waste Management and Resource Efficiency, Singapore, 2019// 2019)
[159] https://recycle.epa.gov.tw/en/index.html

Income for the Recycling Fund is generated by the **advance recycling fee** paid by producers. The Recycling Fund Management Board uses these funds to plan and implement various recycling programs.

Local councils may profit from the **sale of recyclable materials** collected. Part of the funds generated by local councils must **feed back to the public** through payments for regulated recyclables.

The 4-in-1 Program is successful because the public are provided a **free twice-daily collection service**, which reduces the accumulation of household wastes. Alternately, the public are **paid to drop off recyclables at collection points**.

In addition, a **parallel pay-as-you-throw-scheme** charges residents for waste by volume using pre-paid garbage bags. This resulted in the removal of public bins to prevent illegal disposal.

To help reduce the number of pre-paid garbage bags required and paid for by residents, a **free food waste composting system** was set up. Education campaigns have also been a key component.

The online self-auditing system has been developed over a number of years. It provides self-auditing processes, which has greatly **reduced the cost of managing the system**. Parent companies may also audit subsidiary companies. The system provides a single waste tracking portal for compliance as well as information for policy development, snapshots and trends, transboundary movement of wastes.

The system includes used tires, lead-acid batteries and vehicles as regulated items. This could be applied in the Pacific where the dumping of end-of-life vehicles is a problem. Consideration could be given to the funding of local collection centres that remove tires and batteries from vehicles for transport to regional recycling centres or transport. Any other reusable/recycle components can be removed before compacting the metal for sale.

Considerations of the "recycling fund" in the context of PICs

The system relies heavily on **community awareness** and sorting. This is promoted by community-based recycling organisations, supported by the fund.

The system also relies on the use of **technology** to **reduce the costs** of monitoring compliance with the scheme. Garbage trucks are fitted with GPS schemes which feed route information to the online system on a regular basis. This allows tracking of routes to assist in identifying illegal dumping activities. CCTV cameras in recycling facilities also facilitate compliance.

In the past, the system has been criticized for **over-reporting** the results for recycling rates achieved.

Consideration must be given to **international companies** that may have EPR obligations under their parent company to maintain their own recycling and treatment schemes. In such cases,

the importer pays an advanced recycling fee to the fund as well as paying to maintain their own scheme. The potential for **double payments** should be considered in any scheme.

6.3.2. Chile: Advance disposal/recycling fee

Brief description and key funding mechanism

Importers and producers of regulated priority products must either individually establish and finance a take-back scheme or establish these processes collectively through Management Schemes (Producer Responsibility Organisations). Contributions by importers and producers to the financing mechanism of the Management Schemes is to be determined by the volume of products placed on the Chilean market as well as the design of the product. This is, in effect, an advance disposal/recycling fee.

How does the "Advance disposal/recycling fee" work?

In 2016, Chile adopted a new EPR Law (Law No. 20.920).[160] The law applies to anyone who sells a priority product for the first time on the Chilean market, who resells a priority product branded as their own and which is obtained from a third party which is not the initial distributor, or anyone who imports a priority product to use commercially.[161] Importers and manufacturers must be registered with the government and provide take-back schemes free of charge. There must be no requirement for those returning used products to purchase a new product.

Priority products are listed as:

- Lubricant oils,
- Electric and electronic equipment,
- Containers and packaging,
- Tires, and
- Batteries.

Targets are set for the collection and recovery of each priority product category which are outlined in separate regulations. These regulations may also establish additional obligations such as labelling, whether further information is to be provided to the supply chain such as the cost of managing the product at end-of-life, public awareness and strategies to **reduce the generation of waste**. Waste management operations, such as collection, sorting and storage facilities may be outsourced to authorised organisations and local councils.

Producers are responsible for setting up and funding take-back programs for the priority products they place on the Chilean market.[162] Producers may observe these obligations

[160] Banguera, L. A. et al, 'Reverse logistics network design under extended producer responsibility: The case of out-of-use tires in the Gran Santiago city of Chile' (2018) 205 (2018/11/01/) *International Journal of Production Economics* 193-200

[161] http://www.mondaq.com/x/496826/Waste+Management/New+regulation+of+capacity+payments+among+power+generation+companies

[162] Art. 8

collectively by establishing non-profit Producer Responsibility Organisations. Membership must be producers only and the organisation must report to the government.[163]

To be authorised as a producer or a PRO, a management plan must be approved by the government. Such plans should address the following:

- List the producers,
- Details of the legal entity and members (PRO only), including procedures for ensuring competition, entry for new members and **contractor tender process**,
- The volume of priority products expected to be placed on the Chilean market,
- The expected lifespan of the product,
- The volume of waste expected to be generated on an annual basis,
- Details of the finance mechanism for funding the take-back scheme,
- Contractor auditing procedures, and
- External auditors for verification of compliance by the scheme.[164]

Reporting obligations by producers include the provision of the amount of priority products placed on the Chilean market during the preceding year, information on collection, recycling and disposal activities undertaken in the previous year in compliance with the set targets, as well as who performed those operations (the producer themselves or as part of a Producer Responsibility Organisation).[165] The costs of recycling and method of calculation must also be disclosed.[166] These reports are to be verified by an external auditor. Once in operation, management plans must be approved by the government every five years.[167]

Information on the producers, authorised waste managers, take-back programs, targets, etc will be made publicly available through a government registration scheme.

The EPR framework in Chile only allows importers and producers who meet the set targets for priority products to operate within the Chilean market. There are also penalties for non-compliance.[168]

Advantages of the "Advance disposal/recycling fee"

The management plans submitted by PRO schemes are required to include the contractor tender process. This is important for ensuring competition in the market and preventing monopolies that can inflate pricing of collection and recycling services provided to the scheme. The EPR law also allows for regulations to be adopted that require PROs to develop

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[163] Art. 17

[164] OECD, *What have we learned about Extended Producer Responsibility in the past decade? Case Study – Chile.* (2014)

[165] https://www.loraxcompliance.com/blog/env/2018/06/13/Approaching_deadline_for_EPR_reporting_in_Chile.html

[166] Art. 18

[167] OECD, above n 164

[168] https://www.loraxcompliance.com/blog/env/2017/04/13/Should_you_be_reporting_under_new_EPR_regulations_in_Chile_.html

strategies to **reduce the generation of waste**. This could be an important step in bringing the increasing issue of waste management under control.

Considerations of the "Advance disposal/recycling fee" in the context of PICs

There are a number of requirements to ensure the transparency of PROs and the schemes they operate. This includes **external auditors** to verify the data reported on by PROs. Governments must **authorise and monitor** the PROs and their management plans and verify the fee charged to members reflects a realistic cost for collection and recycling. In addition, governments must authorise each contractor providing collection, storage and recycling services. This can add a significant burden to authorities that is not currently provided for.

6.3.3. Packaging waste: the Australian Packaging Covenant

Brief description and key funding mechanism

The Australian Packaging Covenant is a co-regulatory scheme operating at the national level. Regulation of the scheme is the responsibility of the States and territories under their respective regulations but in compliance with national legislation. The collection and end-of-life treatment of packaging is managed and funded by industry, as well as the administration of the Covenant.

How does the "Packaging Covenant" work?

Australia's *National Waste Policy* provides for national product stewardship programs in a voluntary, co-regulatory or mandatory capacity. The Australian Packaging Covenant is a co-regulatory mechanism under the national *Product Stewardship Act 2011* and the *National Environment Protection (Used Packaging Materials) Measure 2011*.[169] The latter sets out the scope of the Covenant.

The Australian Packaging Covenant Organisation Ltd (APCO) represents industry members from the packaging supply chain. **Together with the Australian government** (national, state and territory), the Covenant was first developed in 1999. This agreement between government and industry is renewed periodically. The most recent agreement was adopted in 2017. A 5-year Strategic Plan is developed by APCO, which guides implementation of the Covenant.[170] **Packaging targets** have also been set by the organization at the national level.

As per the *National Environment Protection (Used Packaging Materials) Measure 2011*, signatories to the Covenant have committed to:

- design packaging to minimise use of materials and elimination of excessive packaging, adopt and implement the Environmental Code of Practice for Packaging,
- support materials recovery systems and infrastructure for reprocessing used packaging materials in collaboration with state and local governments, and

[169] Available at https://www.legislation.gov.au/Details/F2011L02093. See Section 3 for more on the Australian National Waste Policy.

[170] Available at: https://www.environment.gov.au/system/files/resources/e2f0f12e-fa6e-4a4b-94e3-1268d9cd1360/files/australian-packaging-covenant-strategic-plan-2017-2022.pdf

- report and demonstrate continuous improvement against the key performance indicators and targets specified in the Covenant.[171]

The Covenant is open to signatory by local governments. Those that sign the Covenant are committed to providing curbside collection services for recyclable packaging.[172]

Businesses that consume packaging or packaged products and have a minimum turnover of $5million per year can participate in the Covenant by joining APCO. For those brand owners who choose not to participate in the scheme, the *National Environment Protection (Used Packaging Materials) Measure 2011* sets out the obligations that must be met.[173] These measures are enforced by state and territory governments and help reduce **free-riders**. Included in the measures is the duty of all jurisdiction to **set aside sufficient funds to ensure compliance by non-signatories**.[174] Those businesses that participate in the Covenant are not required to comply with state and territory regulations.

In 2018, APCO set National Packaging targets for 2025 and will take the lead in achieving these goals. These targets agreed by industry are:

- 100% of all Australia's packaging will be reusable, recyclable or compostable by 2025 or earlier,
- 70% of Australia's plastic packaging will be recycled or composted by 2025,
- 30% average recycled content will be included across all packaging by 2025,
- Problematic and unnecessary single-use plastic packaging will be phased out through design, innovation or introduction of alternatives.[175]

Achievement of these goals is supported by the Sustainable Packaging Guidelines.[176] In addition, the **Australasian Recycling Label** was developed in collaboration with Planet Ark and PREP Design.[177] This initiative will assist customers in making the right decision when disposing of packaging, thereby contributing to achieving the targets set by APCO.

The performance of the Covenant is **reported annually** to the environment ministers of each state and territory. Each state government must also report annually against indicators and develop action plans for their jurisdictions.[178] The *National Environment Protection (Used Packaging Materials) Measure 2011* sets out a National Environment Protection Protocol that outlines methods for achieving the outcomes of the Measure, both through the Covenant and by non-participating brand owners. These provide for measurements of effectiveness and include the collection of information and reporting, the type of recovery data to be collected

[171] Section 5(3).
[172] Section 5(4)
[173] Section 9
[174] Section 10
[175] https://www.packagingcovenant.org.au/news/business-and-government-unite-to-tackle-waste-challenge
[176] Available at: https://www.packagingcovenant.org.au/documents/item/1091
[177] https://planetark.org/recyclinglabel/
[178] https://www.epa.nsw.gov.au/your-environment/recycling-and-reuse/warr-strategy/product-stewardship-schemes

by brand owners, information on local council curbside collections and the community covered by such collections.

Advantages of the "Packaging Covenant"

The Covenant provides a **platform for industry and government to engage** on the issue of consumer packaging. It has also resulted in guidelines being produced and a national recycling labelling scheme to include consumers in the process of improving recycling rates. Industry has also come together to set **self-determined targets** for the management of end-of-life packaging, removing the need for government to negotiate targets, which can be a lengthy and costly exercise. The targets include the phasing out of "problematic and unnecessary" single-use plastic packaging, an approach which would benefit PICs.

Considerations of the "Packaging Covenant" in the context of PICs

The Covenant places an obligation on participating local councils to manage effective waste collection services to ensure success of the scheme. Fees are payable from the scheme for these collection services. Where councils are unable to sufficiently monitor the recovery by non-participating brand owners, the packaging of these brand owners will likely be placed in collection services provided by councils. The **additional workload** placed on local councils for collecting information and **reporting** would also need to be considered.

6.3.4. Reverse distribution: Battery Recycling in British Columbia, Canada

Brief description and key funding mechanism

The Canadian Battery Association[179] operates a reverse distribution system whereby used lead-acid batteries are collected from distributors when dropping off new batteries. To incentivize recovery, the distributors are charged a fee on most automotive batteries as of 2017. An environmental fee is not charged to the consumer.

How does "reverse distribution" work?

The Canadian state of British Columbia adopted the *Recycling Regulation (B.C. Reg. 449/2004)* under the state's Environmental Management Act. The regulation covers, amongst other products, lead-acid batteries[180] and aims to improve the recovery rate of scheduled products. The recovery rate is defined as "the amount of product collected divided by the amount of product produced, expressed as a percentage."

Producers who sell, offer for sale, distribute or use in a commercial enterprise any of the scheduled products in British Columbia must either provide an **EPR Plan** or adhere to stipulated EPR measures outlined in the Recycling Regulation (B.C. Reg. 449/2004).[181] Small producers (as defined by regulations) are **exempt**.

[179] http://www.canadianbatteryassociation.ca

[180] Other products covered are antifreeze, beverage containers, solvent and flammable liquids, pesticide product category, gasoline, pharmaceuticals, lubricating oil, empty oil containers, oil filters, paint, electronic and electrical products, tires, packaging and paper.

[181] Part 2, Art. 4

Considerations for approval of EPR Plans include, amongst others:[182]

- a 75% recovery rate (or one established by the director),
- satisfactory consultation with stakeholders,
- the plan adequately provides for the producer collecting and paying the costs of collecting and managing products (whether currently or previously provided),
- the producer provides **reasonable and free** consumer access to collection facilities or collection services,
- **consumers are made aware** of the program, the location of collection facilities or the availability of collection services, and how to manage products in a safe manner.

The EPR Plan must also demonstrate the impact of the efforts relative to the population size and market penetration. Approval of the plan therefore also includes consideration of:[183]

- the population and **geographical area** of the product market,
- the amount of product expected to be sold, offered for sale, distributed of used in a commercial enterprise each year,
- the amount of product the producer expects to collect each year,
- the size of the population intended to be served by the producer's collection facilities or collection services, and
- the provision of convenient options for the collection of products in urban centers and small, **isolated communities**, and for persons with disabilities or who have no access to transportation.

The EPR Plans incentivize environmentally friendly design of products by requiring strict adherence to the **waste hierarchy**, focusing on the pollution generated by the product throughout its lifecycle. Application of a lower level within the waste hierarchy must not be undertaken "unless or until all feasible opportunities for pollution prevention at a higher level have been taken." This waste hierarchy is defined as:

1. reduce the environmental impact of producing the product by eliminating toxic components and increasing energy and resource efficiency,
2. redesign the product to improve reusability or recyclability,
3. eliminate or reduce the generation of unused portions of a product that is consumable,
4. reuse the product,
5. recycle the product,
6. recover material or energy from the product, and
7. otherwise dispose of the waste from the product in compliance with the Act.[184]

Annual reports that outline **progress, targets and compliance** with the Recycling Regulation must be provided for each EPR Plan and posted on the Internet.[185] The plan must also be reviewed every 5 years.[186]

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[182] Art. 5
[183] Art. 5
[184] Art. 5(3)
[185] Art. 8
[186] Art. 6

Where EPR Plans are not provided, producers must **provide consumer information for free to retailers** that guide safe use and storage of the product, any deposit amount charged with the corresponding refund paid by the producer and any fee charged as part of the EPR program which must be listed separately on the consumer receipt.[187] This information must also be made clearly visible to customers by the retailer and the producer must post this information on the Internet. Similar to the requirements for EPR Plans, **annual reporting** must be provided for these EPR programmes. As regulated for the EPR Plans, incentive for environmentally friendly design of products is included through the requirement for reports to indicate "efforts taken by or on behalf of the producer through redesign or repackaging to reduce product waste."[188]

The Recycling Regulation also provides for the location of **collection facilities relative to retailers**. These collection facilities must be made available free of charge to any consumer, no matter the volume of products returned and must operate during regular business hours, 5 days per week, one day of which must be Saturday.[189]

Both EPR Plans and EPR Programmes are required to be complied with.[190] Contraventions constitute an offence and can incur a fine of $200,000 or less.

Members of the Canadian Battery Association have a 95% market share for lead-acid batteries. In response to the Recycling Regulation, the Association adopted a reverse distribution system as the primary mechanism for collecting lead-acid batteries. Thousands of retailers and industrial, commercial and institutional customers are serviced in this way on a weekly to monthly basis.[191] Distributors must pay an $18 core charge on the majority of automotive batteries purchased.

As per the Association's annual report, the average distance to Return Collection Facilities for different sized communities has been calculated at:[192]

- > 30,000 people = 2.1km
- 4,000 to 30,000 people = 3.0km
- 1,000 to 4,000 people = 18.1km

Results of "reverse distribution"

In 2017, the Canadian Battery Association calculated the product recovery rate as:

- 91.6% of automotive lead-acid battery sales,
- 69.7% of industrial lead-acid battery sales, and

[187] Art. 10
[188] Art. 14(2)
[189] Art. 11
[190] Art. 2(1)
[191] Canadian Battery Association, *Canadian Battery Association Annual Report to the Director - 2016 Calendar Year* (2017)
[192] Canadian Battery Association, *Canadian Battery Association Annual Report to the Director - 2017 Calendar Year* (2018)

- 88.3% recovery of all lead-acid battery sales.

Studies of landfill diversion rate were calculated at nearly 100% for all three categories.[193]

Advantages of "reverse distribution"

Approval EPR Plans for battery take-back schemes consider the options provided to **isolated communities** to participate in the scheme. Application of this concept would allow for some responsibility to be placed on importers and manufacturers to develop innovative methods for reaching remote island communities. The reverse distribution system illustrated here could be adapted and possibly combined with the backloading programs described in Chapter 5.

Considerations of "reverse distribution" in the PICs context:

The distributor is responsible for paying the deposit on the battery to **incentivise recovery** and participation in the reverse distribution program. The Canadian example aims to place **no fee on the consumer**. This is advantageous to developing countries where the danger of EPR schemes is that too much of the costs are transferred to the consumer, potentially leading to illegal dumping.

6.4. Discussion

The legal basis for an EPR scheme is commonly set in national waste management legislation. This can be complemented by a separate EPR law that can include general measures for the types of products to be regulated. In addition, the establishment and regulation of PROs, compliance measures and the roles of government, industry and consumers must be legislated. Targets and other management strategies for individual product categories can be mandated in separate regulations. Legislation should be designed in consultation with the industry sectors that would be required to participate in a mandatory take-back scheme and, importantly, allow for flexibility in how industry wishes to comply and measures to reduce free-riders.

It is important that PROs operate on a **non-profit basis** with industry membership only. To ensure transparency and prevent monopolies, services contracted to the PRO should be enlisted on an **open tender basis**. Monitoring of the operations must be completed by **independent auditors**. Overall, the role of consumers, local councils, PROs and producers that are not members of a PRO must be clearly defined.

PICs rely heavily on imported products. As for polluter pays schemes, EPR schemes would require financial contributions made by importers to be collected by Customs officials. There are a limited number of entry points for products into Solomon Islands and Vanuatu, making it relatively straight-forward to capture these fees. However, the additional administrative overheads would need to be considered, as well as the suitability of current processes.

[193] Ibid

The examples of Taiwan and Chile illustrate implementation of extended producer responsibility schemes which both place financial responsibility on the producer for the collection and recycling of their products, but include the duty to **design their products** so as to reduce the generation of waste and harm to the environment. However, for Taiwan, the fee paid by producers is deposited in a government-administered and operated fund that is dedicated to improving recycling. In Chile, the fees are paid into an **industry-managed scheme** which manages the collection and recycling programs on behalf of the industry members. In contrast, the industry-led Australian Packaging Covenant is an **agreement between industry and government** that sets design and recycling targets, requiring that industry members from the packaging supply chain support materials recovery systems in collaboration with government.

Collection costs are charged to the distributors of lead-acid batteries in British Columbia, Canada. This fee is not passed on the customer, but can be reclaimed by the distributor when returning the battery to the producer. This establishes a **reverse distribution** collection system and would be an option worth considering in most PICs.

7. EMERGING OPTIONS FOR CONSIDERATION

The Moana Taka partnership between Swire Shipping and SPREP[194] aims to enhance shipping options between PICs and from the regional to overseas markets. This service is provided pro bono by Swire Shipping. Although in its infancy, the partnership has the potential to deliver on an envisaged regional plan for recycling facilities and the export of products once international end-markets are found. These services are for non-commercial shipments only.

Emerging innovation to consider:

Incineration of wastes requires large amounts of power and long-term provision of large volumes of waste. It also locks in waste as a feedstock, preventing entry of new technologies into the market. To avoid the need for incineration, the following technologies may provide alternate options for consideration:

- UNSW micro-factories provide options for decentralised and mobile waste management. These micro-factories have been developed for eWaste (including mobile phones)[195] and other wastes[196] and are in pilot phase.
- Pyrolysis[197] for road-ready fuel.[198] Smaller facilities can provide distributed waste management options with benefits for the local communities. For example, consumers could bring waste to the facility and be paid in fuel or ferry tickets (if fuel generated is used for the ferry). Ferries and trucks could also participate by backloading waste to a pyrolysis facility.
- Clean access bonds (CABs) and Clean Tax Cuts (CTCs)[199] can provide innovative funding for waste management infrastructure.

8. SUMMARY AND CONCLUSION

Waste management in the Pacific Island Countries suffers from a number of socio-economic and geographical challenges. This study has focused on two primary challenges, namely funding and transport. Both these challenges have been addressed through the studies presented in the categories of polluter pays schemes, best practices and extended producer responsibility schemes.

Best practices reflected in this report have highlighted the following approaches:

1. Reducing the need to transport waste from remote areas, e.g. *in situ* use of wastes
2. Transforming transport from scheduled to on-demand systems,
3. Reducing the cost of transport through backloading with incentives for participation (also reducing the need to establish new transport systems), and

[194] https://www.sprep.org/news/moana-taka-partnership-unfolds-exciting-recycling-possibilities-pacific-islands
[195] https://newsroom.unsw.edu.au/news/science-tech/world-first-e-waste-microfactory-launched-unsw
[196] https://newsroom.unsw.edu.au/news/science-tech/turning-old-clothes-high-end-building-materials
[197] See https://www.sciencedirect.com/science/article/pii/S2451904917300690
[198] https://www.plasticsnewseurope.com/article/20180618/PNE/180619925/bin2barrel-marks-start-of-construction-of-innovative-plastic-to-fuel-plant
[199] https://spectator.org/the-free-market-solution-to-the-plastic-problem-clean-tax-cuts/; https://www.greenbiz.com/article/clean-tax-cuts-and-global-free-market-plastic-solutions

4. The use of technology to facilitate flows between supply and demand.

The legislation in both Solomon Islands and Vanuatu provide for the adoption of legislation for extended producer responsibility or product stewardship schemes. These would go beyond the implementation of the polluter pays principle in the form of container deposit schemes or simple take-back schemes in that the type of product placed on the markets of both countries could be controlled according to environmental and socio-economic criteria.

Polluter pays and EPR schemes can follow one of the following approaches for manufacturers to contribute to the recovery of waste from households:

1. Implementing a deposit-and-return scheme,
2. Joining an industry run, government-approved recovery organization, or
3. Implementing and maintaining their own government-approved recovery scheme.

In many countries, the recovery organisations are operated on a not-for-profit basis. Where single organisations exist, issues of monopoly can be overcome by mandating a transparent tender process for contractors. The issue of free-riders can also be overcome by mandating participation by all importers, manufacturers and/or retailers. Participation fees can then be based on volume, turnover and other considerations of fairness within the local context.

Options to incentivise the supply of environmentally-friendly products on the markets of PICs include:

1. Banning of products considered harmful or unmanageable within local or regional options for environmentally sound management of wastes.
2. Variable fees based on a number of environmental criteria (reduced for more environmentally-friendly products and increased for less environmentally-friendly products). This can be adapted to include products that can be economically collected, handled and recycled within the region or exported in compliance with international restrictions.

Holding the producer responsible financially and physically for the end-of-life treatment of their products can assist in removing the burden on local councils to provide collection services, storage facilities and recycling or export options, as well as offering awareness programs.

The examples highlighted in this report for polluter pays schemes, best practices and extended producer responsibility schemes cannot act in isolation. An integrated approach to waste management is required that includes landfill levies, composting programs and awareness, amongst others. The options illustrated can be combined to obtain different levels of funding from multiple sources as appropriate. Such schemes can offer a way forward for providing cheap options for consumers and businesses to access recycling facilities, thereby reducing the current practices of burning, burying and dumping of wastes. The development of context-appropriate funding mechanisms will prevent harm to humans and the environment and ensure the sustainability of ecosystem services that provide food security and income to Pacific Island inhabitants.

9. References

Asian Development Bank (ADB), *Solid Waste Management in the Pacific - Solomon Islands Country Snapshot* (2014)

Asian Development Bank (ADB), *Solid Waste Management in the Pacific - Vanuatu Country Snapshot* (2014)

Australian Government, *National Waste Policy: Less Waste, More Resources* (2018) <http://www.environment.gov.au/system/files/resources/d523f4e9-d958-466b-9fd1-3b7d6283f006/files/national-waste-policy-2018.pdf>

Australian Government - Department of Environment and Energy, *Voluntary product stewardship - accreditation of arrangements* (2018) <http://www.environment.gov.au/system/files/resources/93e66efc-354c-4df1-b72b-cb620c808e2b/files/vps-accreditation-arrangements-fs.pdf>

Banguera, L. A., J. M. Sepúlveda, R. Ternero, M. Vargas and Ó. C. Vásquez, 'Reverse logistics network design under extended producer responsibility: The case of out-of-use tires in the Gran Santiago city of Chile' (2018) 205 (2018/11/01/) *International Journal of Production Economics* 193-200

Canadian Battery Association, *Canadian Battery Association Annual Report to the Director - 2016 Calendar Year* (2017)

Canadian Battery Association, *Canadian Battery Association Annual Report to the Director - 2017 Calendar Year* (2018)

Defra (Resources & Waste Strategy Team), *Our Waste, Our Resources: A Strategy for England* (2018) <https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/765914/resources-waste-strategy-dec-2018.pdf>

Environment and Climate Change Canada, *Solid Waste Management for Northern and Remote Communities: Planning and Technical Guidance Document* (2017)

Giroux, L., *State of Waste Management in Canada* (Canadian Council of Ministers of Environment, 2014)

Global Environment Facility–Pacific Alliance for Sustainability (GEF-PAS), *Vanuatu National Action Plan to reduce releases of Unintentional Persistent Organic Pollutants 2018-2022* (2018)

Global Information Society Watch, *Focus on ICTs and environmental sustainability* (APC and Hivos, 2010)

Government of Vanuatu - Department of Environmental Protection and Conservation (DEPC), *National Waste Management and Pollution Control Strategy and Implementation Plan 2016-2020* (2016)

Hon. Justice Brian J Preston, *Sustainable Development Law in the Courts: The Polluter Pays Principle (The 16th Commonwealth Law Conference, Hong Kong, 7 April 2009)* (2009)

Jambeck, J. R., G. Roland, W. Chris and R. S. Theodore, 'Plastic waste inputs from land into the ocean' (2015) 347(6223) *Science (New York, N.Y.)* 768-771

Joanne Chong, Leah Mason, Stefanie Pillora and D. Giurco, *Product Stewardship Schemes in Asia: China, South Korea, Japan and Taiwan* (Australian Department of the Environment, Water, Heritage and the Arts, 2009)

Leney, A., *Review of Regional E-Waste Recycling, Including a Model Product Stewardship Approach for Pacific Island Nations* (Pacific Reef Savers Ltd, 2013)

Ma, H.-K., 'E-waste Recycling in Taiwan' (Paper presented at the Waste Management and Resource Efficiency, Singapore, 2019// 2019)

Mary O'Reilly & Luganville Municipality, *Luganville Waste Characterisation Report* (2013)

Md Tasbirul Islam, Pablo Dias and N. Huda, 'Comparison of E-Waste Management in Switzerland and Australia: A Qualitative Content Analysis' (2018) 12(10) *International Journal of Environmental and Ecological Engineering*

MobileMuster, *2017 Annual Report, Appendix* (2017) <http://www.environment.gov.au/system/files/pages/11109e41-0116-46e9-bcad-1fa4f21a1258/files/mobilemuster-annual-report-2017-appendix.pdf>

MobileMuster, *2018 Annual Report* (2018) <https://www.mobilemuster.com.au/wp-content/uploads/2018/11/MOB_AnnualReport2018_AMEND02.WEB_.pdf>

OECD, *Extended Producer Responsibility: Updated Guidance for Efficient Waste Management* (OECD Publishing, 2016)

OECD, *What have we learned about Extended Producer Responsibility in the past decade? Case Study – Chile.* (2014)

Pacific Reef Savers Ltd, *Summary Report to the PacWaste Technical Advisory Panel The Collection: Collation and Review of Data on the Status of E-Waste Management In Pacific Island Countries Including a Cost-Benefit Analysis of Capacity for Electrical and Electronics Goods Recycling, Repair or Refurbishment* (2014)

Pacific Region Infrastructure Facility (PRIF), *Pacific Region: Solid Waste Management and Recycling - Pacific Country Profiles* (2018)

Pacific Region Infrastructure Facility (PRIF), *Pacific Region: Solid Waste Management and Recycling. Pacific Country Profiles* (2018) <https://www.theprif.org/documents/regional/urban-development-waste-management/pacific-region-solid-waste-management-and>

Research Office of the Legislative Council Secretariat, Government of Hong Kong, *Information note: South Korea's waste management policies* (2013) <https://www.legco.gov.hk/yr12-13/english/sec/library/1213inc04-e.pdf>

Sang-Hun, L., *Policies for Sustainable Resources Management in the Republic of Korea* (International Policy Research Center. Korea Environment & Resources Corporation, 2006)

Solomon Islands Government - Ministry of Environment, C. C., Disaster Management and Meteorology,, *Solomon Islands : waste management and pollution control strategy 2017-2026* (SPREP, 2017)

SPREP, *Cleaner Pacific 2025: Pacific Regional Waste and Pollution Management Strategy 2016–2025: Implementation Plan* (SPREP, 2016) <http://www.sprep.org/attachments/Publications/WMPC/cleaner-pacific-strategy-imp-plan-2025.pdf>

SPREP, *Pacific Ocean Pollution Prevention Programme (PACPOL) : Strategy and Work Plans 2015-2020* (2015)

SPREP, *Practical Guide to Solid Waste Management in Pacific Island Countries and Territories* (2018)

SPREP, *Regulating plastics in Pacific Island Countries: a guide for policymakers and legislative drafters* (2018) <https://www.sprep.org/sites/default/files/documents/publications/Plastics%20Digital.pdf>

SPREP, *Solomon Islands : Waste Management and Pollution Control Strategy 2017-2026* (2017)

Takeya, D. H., *Collection, disposal and exchange of waste agricultural plastics in Japan, the Republic of Korea and China* (2009) <http://www.techmonitor.net/tm/images/3/31/09jan_feb_sf6.pdf>

UNEP/ISWA, *Global Waste Management Outlook* (United Nations Environment Programme, 2015)

United States Environmental Protection Agency (EPA), *Recycling and Waste Electrical and Electronic Equipment Management in Taiwan: A Case Study* (2012) <https://19january2017snapshot.epa.gov/international-cooperation/case-study-taiwans-e-waste-management-system_.html>

United States Environmental Protection Agency (EPA), *Recycling Regulations in Taiwan and the 4-in-1 Recycling Program (Handout for Workshop Materials on WEEE Management in Taiwan, October 2012)* (2012) <https://www.epa.gov/sites/production/files/2014-05/.../handout-1a-regulations.pdf>

Unknown, *Review of e-waste Related Activities in the Pacific Islands* (2018) <https://www.sprep.org/attachments/report4-ewaste-baseline-2018.pdf>

Vanuatu Department of Energy, *Environmental and Social Management Framework for the Vanuatu Rural Electrification Project Stage II (VREP II)* (2016)

Welsh Assembly Government, *Towards Zero Waste. One Wales: One Planet* (2010)

Welsh Government, *Towards Zero Waste 2010 - 2050: Progress Report* (2015)

Yasuhiko Hotta, Atsushi Santo and T. Tasaki, *EPR-based Electronic Home Appliance Recycling System under Home Appliance Recycling Act of Japan* (OECD, 2014) <https://www.oecd-ilibrary.org/environment/extended-producer-responsibility/recycling-of-electronic-home-appliances-in-japan_9789264256385-17-en>

Appendix 1: International and regional policy support for implementation of polluter pays principle

Instrument (Binding/Voluntary)	Polluter pays principle – explicit or inferred
UNCLOS (B)	None
Basel Convention (B)	**Preamble** Mindful also that the most effective way of protecting human health and the environment from the dangers posed by such wastes is the reduction of their generation to a minimum in terms of quantity and/or hazard potential, Noting that States should ensure that the generator should carry out duties with regard to the transport and disposal of hazardous wastes and other wastes in a manner that is consistent with the protection of the environment, whatever the place of disposal, **Art. 4, 2** Each Party shall take the appropriate measures to: (c) Ensure that persons involved in the management of hazardous wastes or other wastes within it take such steps as are necessary to prevent pollution due to hazardous wastes and other wastes arising from such management and, if such pollution occurs, to minimize the consequences thereof for human health and the environment;
Stockholm Convention (B)	**Preamble** Reaffirming Principle 16 of the Rio Declaration on Environment and Development which states that national authorities should endeavour to promote the internalization of environmental costs and the use of economic instruments, taking into account the approach that the polluter should, in principle, bear the cost of pollution, with due regard to the public interest and without distorting international trade and investment
CBD (B)	**Art. 10(e)** Encourage cooperation between its governmental authorities and its private sector in developing methods for sustainable use of biological resources. **Art. 11** Incentive Measures. Each Contracting Party shall, as far as possible and as appropriate, adopt economically and socially sound measures that act as incentives for the conservation and sustainable use of components of biological diversity. **Art. 14(b)** Introduce appropriate arrangements to ensure that the environmental consequences of its programmes and policies that are likely to have significant adverse impacts on biological diversity are duly taken into account
Honolulu Strategy (V)	**Goal A** - Land-based. Promote economic incentives for recycling and composting by encouraging governments to make recycling and composting more widely available and cost effective (i.e. , free or with low associated costs) and the landfilling option

	more expensive Depending on local socio-economic circumstances, existing infrastructure, and suitable alternatives, create incentives (e.g., taxes, deposits) for consumers, governments and industry to assist in the recovery of highly littered products. Utilize economic instruments such as taxes/fines for littering and impose heavier fees for not recycling when those activities are available. **Strategy A2.** Employ market-based instruments to support solid waste management, in particular waste minimization.
MARPOL Annex V (B)	None
London Convention (B)	None
London Protocol (B)	**Art. 3.2** Taking into account the approach that the polluter should, in principle, bear the cost of pollution, each Contracting Party shall endeavour to promote practices whereby those it has authorized to engage in dumping or incineration at sea bear the cost of meeting the pollution prevention and control requirements for the authorized activities, having due regard to the public interest.
Fish Stocks Agreement (B)	None
FAO Code of Conduct (V)	**7.7.4** States and subregional or regional fisheries management organizations and arrangements, as appropriate, should agree on the means by which the activities of such organizations and arrangements will be financed, bearing in mind, inter alia, the relative benefits derived from the fishery and the differing capacities of countries to provide financial and other contributions. Where appropriate, and when possible, such organizations and arrangements should aim to recover the costs of fisheries conservation, management and research. **8.2.3** Fishing vessels authorized to fish on the high seas or in waters under the jurisdiction of a State other than the flag State, should be marked in accordance with uniform and internationally recognizable vessel marking systems such as the FAO Standard Specifications and Guidelines for Marking and Identification of Fishing Vessels. **8.2.4** Fishing gear should be marked in accordance with national legislation in order, that the owner of the gear can be identified. Gear marking requirements should take into account uniform and internationally recognizable gear marking systems.
Noumea Convention (B)	None
Pacific Dumping Protocol (B)	None
Waigani Convention (B)	None

Pacific Regional Waste and Pollution Management Strategy 2016-2025 (V)	**PRINCIPLE 3** Polluter pays principle Waste producers and polluters should pay the cost of managing their waste or cleaning up the pollution and remediating associated environmental damage. 1. Reduce, Reuse, Recycle, Return (3Rs +Return) 3. Polluter pays principle 8. Expand user-pays WCP collection services
PACPOL 2015-2020 (V)	Reinforce the internationally accepted practices of "polluter pays" with the establishment and enforcement of local marine pollution protection legislation and of the "potential polluter pays" with the focus on ensuring Tier 1 sites are self-sufficient and a national levy system to support incountry resources. (2.0)
Pacific Marine Litter Action Plan 2018 (V)	**6.2** Support PICTs expand user-pay waste collection services (CP2025-8.1 to 8.4) **9.1** Develop, adopt and implement cross compliance provisions as part of Pacific Island Tourist Resort access licences are renewed or new developments approved

Appendix 2: International and regional policy support for implementation of best practices

Instrument (Binding/Voluntary)	Best practices – explicit or inferred
UNCLOS (B)	**Art. 207** - Pollution from land-based sources 2. States shall take other measures as may be necessary to prevent, reduce and control such pollution. **Art. 210** - Pollution by dumping 2. States shall take other measures as may be necessary to prevent, reduce and control such pollution.
Basel Convention (B)	Aware of the need to continue the development and implementation of environmentally sound low-waste technologies, recycling options, good house-keeping and management systems with a view to reducing to a minimum the generation of hazardous wastes and other wastes **Art. 4.2(b)** Ensure the availability of adequate disposal facilities, for the environmentally sound management of hazardous wastes and other wastes, that shall be located, to the extent possible, within it, whatever the place of their disposal; **Art. 4.7(b)** Require that hazardous wastes and other wastes that are to be the subject of a transboundary movement be packaged, labelled, and transported in conformity with generally accepted and recognized international rules and standards in the field of packaging, labelling, and transport, and that due account is taken of relevant internationally recognized practices;

	Art. 10.2 To this end, the Parties shall: (a) Upon request, make available information, whether on a bilateral or multilateral basis, with a view to promoting the environmentally sound management of hazardous wastes and other wastes, including harmonization of technical standards and practices for the adequate management of hazardous wastes and other wastes;
Stockholm Convention (B)	**Art. 5(b)** Promote the application of available, feasible and practical measures that can expeditiously achieve a realistic and meaningful level of release reduction or source elimination; **Art. 5(e)** Promote, in accordance with its action plan, the use of best available techniques and best environmental practices **Art. 7.3** The Parties shall endeavour to utilize and, where necessary, establish the means to integrate national implementation plans for persistent organic pollutants in their sustainable development strategies where appropriate.
CBD (B)	**Art. 6** Each Contracting Party shall, in accordance with its particular conditions and capabilities: **(a)** Develop national strategies, plans or programmes for the conservation and sustainable use of biological diversity or adapt for this purpose existing strategies, plans or programmes which shall reflect, inter alia, the measures set out in this Convention relevant to the Contracting Party concerned; and (b) Integrate, as far as possible and as appropriate, the conservation and sustainable use of biological diversity into relevant sectoral or cross-sectoral plans, programmes and policies. **Art. 7(c)** Identify processes and categories of activities which have or are likely to have significant adverse impacts on the conservation and sustainable use of biological diversity, and monitor their effects through sampling and other techniques;
Honolulu Strategy (V)	**Goal A. Strategy A3.** Employ infrastructure and implement best practices for improving stormwater management and reducing discharge of solid waste into waterways management. Improve product labeling (including an explanation of recycling/resin identification` codes) to facilitate proper disposal methods (including recycling labels and “end-of -life” options). Industry codes and institutional purchasing practices can minimize the amount of excessive packaging and disposable products. Promote and implement BMPs for the capture of trash in municipal stormwater systems, including the installation and maintenance of full trash-capture devices as well as the specific good housekeeping measures (street sweeping, trash hot spot identification and cleanup, and compliance assistance). Implement adequate technology and BMPs for stormwater debris control

	Strategy B3. Develop and strengthen implementation of industry best management practices (BMP) designed to minimize abandonment of vessels and accidental loss of cargo, solid waste, and gear at sea. Conduct education and outreach programs related to relevant legislation and best practices/technologies for the prevention, reduction, and management of aquaculture-related debris and other solid wastes that engage aquaculturists. • Develop and promote the application of BMPs for aquaculture operations and practices, including aquaculture equipment and gear deployment, handling, and maintenance, in order to minimize or reduce the probability of accidental aquaculture equipment and gear loss at sea. Promote use of empty container space to ship waste off island nations. **Goal C. Strategy C1.** Create and promote stewardship concepts such as adopt-a-beach or adopt-a-dive site programs. Encourage and implement the "Fishing for Litter" initiative and other fishing cooperatives for retrieval and possible resale • Develop incentive programs for those who recover and land ALDFG
MARPOL Annex V (B)	**Regulation 8** - Reception facilities 1 Each Party undertakes to ensure the provision of adequate facilities at ports and terminals for the reception of garbage without causing undue delay to ships, and according to the needs of the ships using them. **Regulation 9** - Port State control on operational requirements 1 A ship when in a port or an offshore terminal of another Party is subject to inspection by officers duly authorized by such Party concerning operational requirements under this Annex, where there are clear grounds for believing that the master or crew are not familiar with essential shipboard procedures relating to the prevention of pollution by garbage. **Regulation 10** - Placards, garbage management plans and garbage record-keeping
London Convention (B)	**Preamble** NOTING that marine pollution originates in many sources, such as dumping and discharges through the atmosphere, rivers, estuaries, outfalls and pipelines, and that it is important that States use the best practicable means to prevent such pollution and develop products and processes which will reduce the amount of harmful wastes to be disposed of.
London Protocol (B)	**Art. 13.1.3** information and technical co-operation relating to waste minimization and clean production processes
Fish Stocks Agreement (B)	None

FAO Code of Conduct (V)	**Art. 6.6** Selective and environmentally safe fishing gear and practices should be further developed and applied, to the extent practicable, in order to maintain biodiversity and to conserve the population structure and aquatic ecosystems and protect fish quality. Where proper selective and environmentally safe fishing gear and practices exist, they should be recognized and accorded a priority in establishing conservation arid management measures for fisheries. States and users of aquatic ecosystems should minimize waste, catch of non-target species, both fish and nonfish species, and impacts on associated or dependent species. **Art. 7.2(g)** pollution, waste, discards, catch by lost or abandoned gear, catch of nontarget species, both fish and non-fish species, and impacts on associated or dependent species are minimized, through measures including, to the extent practicable, the development and use of selective, environmentally safe and costeffective fishing gear and techniques. **Art. 7.6.9** States should take appropriate measures to minimize waste, discards, catch by lost or abandoned gear, catch of non-target species, both fish and non-fish species, and negative impacts on associated or dependent species, in particular endangered species. **Art. 8.4.6** States should cooperate to develop and apply technologies, materials and operational methods that minimize the loss of fishing gear and the ghost fishing effects of lost or abandoned fishing gear. **Art. 8.7.3** Owners, charterers and managers of fishing vessels should minimize the taking aboard of potential garbage through proper provisioning practices.
Noumea Convention (B)	**Art. 5.4** Parties shall, taking into account existing internationally recognized rules, standards, practices and procedures, co-operate with competent global regional and sub-regional organisations to establish and adopt recommended practices, procedures and measures to prevent, reduce and control pollution from all sources and to promote sustained resource management and to ensure the sound development of natural resources in conformity with the objectives of this Convention and its Protocols. **Art. 7** - POLLUTION FROM LAND-BASED SOURCES The Parties shall take all appropriate measures to prevent, reduce and control pollution in the Convention Area caused by coastal disposal or by discharges emanating from rivers, estuaries, coastal establishments, outfall structures, or any other sources in their territory.
Pacific Dumping Protocol (B)	None
Waigani Convention (B)	**Art. 1** "Environmentally sound management of hazardous wastes" means taking all practicable steps to ensure that hazardous

	wastes are managed in a manner which will protect human health and the environment against the adverse effects which may result from such wastes;
Pacific Regional Waste and Pollution Management Strategy 2016-2025 (V)	Promote and where possible implement world's best practice in managing ship sourced waste for marine environment protection. (7.1)
PACPOL 2015-2020 (V)	**6.3** Implement the Moana Taka Partnership agreement with Swire 2018 to 2021 and beyond. **7.2** Develop and implement 'Clean schools' and 'Clean Campus' programmes to encourage adoption of waste reduction and recycling best practices in schools and educational institutions (CP2025-6.7) **7.3** Implement marine litter and microplastics data collection app for the Pacific **8.3** Fostering greater awareness among Cruise Ships and resort staff through ecotourism certification schemes

Appendix 3: International and regional policy support for implementation of extended producer responsibility programmes

Instrument (Binding/Voluntary)	EPR programmes – explicit or inferred
UNCLOS (B)	None
Basel Convention (B)	**Art. 4.2** Each Party shall take the appropriate measures to: (a) Ensure that the generation of hazardous wastes and other wastes within it is reduced to a minimum, taking into account social, technological and economic aspects; **Art. 4.13** Parties shall undertake to review periodically the possibilities for the reduction of the amount and/or the pollution potential of hazardous wastes and other wastes which are exported to other States, in particular to developing countries.
Stockholm Convention (B)	**Art. 10.3** Each Party shall, within its capabilities, encourage industry and professional users to promote and facilitate the provision of the information referred to in paragraph 1 at the national level and, as appropriate, subregional, regional and global levels.
CBD (B)	None

Honolulu Strategy (V)	**Goal A** Provide economic incentives to develop products with less potential to contribute to marine debris, taking into consideration life cycle assessment and waste management hierarchy of those products. **Goal A** Expand voluntary "Extended Producer Responsibility" activities and promote stewardship projects with industry, and where applicable, establish timelines and metrics for implementation **Strategy A3** Support production and implementation of approaches based on life cycle information to include comprehensive environmental impacts of alternative materials and products.
MARPOL Annex V (B)	None
London Convention (B)	None
London Protocol (B)	None
Fish Stocks Agreement (B)	None
FAO Code of Conduct (V)	None
Noumea Convention (B)	None
Pacific Dumping Protocol (B)	None
Waigani Convention (B)	"Cleaner production" means the conceptual and procedural approach to production that demands that all phases of the lifecycle of a product or process should be addressed, with the objective of prevention or minimisation of short and longterm risks to humans and to the environment; **Art. 10.2(c)** Cooperate, subject to their national laws and policies, in the development and implementation of new environmentally sound and cleaner production technologies and the improvement of existing technologies. Such cooperation shall be with a view to eliminating, as far as practicable, the generation of hazardous wastes and achieving more effective and efficient methods of ensuring their management in an environmentally sound manner, including the study of the economic, social and environmental impacts of the adoption of such new and improved technologies;
Pacific Regional Waste and Pollution Management Strategy 2016-2025 (V)	**PRINCIPLE 2** Product stewardship: Those involved in producing, importing, selling, using and disposing of products have a shared responsibility to ensure that those products or materials are managed throughout their lifecycle in a way that reduces their impact on the environment and on human health and safety. Targets:

	No. of national EPR programmes for e-waste No. of national EPR programmes for used oil
PACPOL 2015-2020 (V)	None
Pacific Marine Litter Action Plan 2018 (V)	**6.1** Implement solid waste management initiatives and actions as outlined in the Cleaner Pacific 2025 moving from a linear economy to a circular economy of Reuse, Reduce, Recycle and Return. Applying Resource Recovery Schemes and Extended Producer Responsibility schemes (CP2025-6.1 & 6.4)

Appendix 4: Adoption of the three principles within national legislation – Solomon Islands

Principle	Solomon Islands instruments – explicit or inferred adoption
Polluter Pays	**Environment Act 1998:** **6(1)** The functions of the Division shall be to - (b) develop, establish and administer systems of prevention and control of pollution in both the industrial and non-industrial sectors; **6(2)** For the purposes of promoting sustainable development as envisaged under subsection (1)(a), the Division shall as far as practicable be guided by the following – **(d)** improved valuation and pricing of environmental resources.
	National Solid Waste Management and Pollution Control Strategy (2017 - 2026): Overarching principles: The polluter pays principle — This principle is also a key principle in the Environment Act 1998 stating that those who cause or generate pollution should bear the cost of it. In the waste management context, the principle means that those who generate waste should bear the cost of managing it so that it does not pose risks to human health and the environment. **10.2.6** Explore the feasibility of establishing a tourism tax system for travellers.
	Maritime Authority Act 2018: **5.** The general principles of maritime administration are as follows: **(a)** the polluter pays principle, which is that the costs of preventing, controlling, reducing and eliminating environmental harm should be borne by the persons who cause or knowingly permit it;
	Maritime Safety Administration Act 2009: **24(1)** For the purposes of this Part, the Administration shall be guided by and shall apply the following principles - (a) the “polluter pays” principle;
	Shipping (Marine Pollution) Regulations 2011: **15(3)** The full or partial cost of providing and operating these waste reception facilities may be recovered by user fees which may be set - (a) by Regulations; or (b) by the Minister if no such Regulations apply; or (c) by any agency which is given responsibility for providing or managing the waste reception facilities. **PART 6 - DUMPING AND INCINERATION OF WASTES AT SEA** **34(6)** The "polluter pays" principle and the precautionary principle shall be applied in the application of this Part as required by section 24 of the Maritime Safety Administration Act 2009.
	Fisheries Management Act 2015: **51.** A licence granted or renewed under this Act shall be subject to payment of- (d) such other fees, charges or levies as are set out in this Act, or as may be prescribed.

	129(1) The Minister may make regulations to carry out and give effect to this Act, including, without limitation - (0) prescribing fees, charges, management levies, resource rent, or royalties payable in respect of any matter under this Act;
	Ports Act 1990: **49(1)** No person shall cause, suffer or permit any refuse, gas, petroleum oil, bilge water, ballast water or other offensive substance whatsoever its nature to be discharged, pumped or cast into or onto any waters or land within the limits of a port without the prior written permission of the Authority. It shall be lawful for the Authority to recover its costs in cleaning up, dispersing or otherwise dealing with any such offensive substance.
Best Practice	**Environment Act 1998:** **6(1)** The functions of the Division shall be to - **2(c)** develop national standards to promote sustainable development and to monitor those standards through environmental auditing;
	National Solid Waste Management and Pollution Control Strategy (2017 - 2026): **9.1.7** Undertake an initial consultation and study for environment tax to be initiated as part of a broader environmental management, of which waste management and pollution control will be components. **9.2.1** The four R's—Refuse, Reduce, Recycle and Reuse—are adopted as the underlying principle of all waste management implementation in the country. **9.2.5** Prepare and formulate national standards and protocols on how to handle all types of waste during segregation, collection and disposal. **10.4.2** Integrate waste management practices into existing franchise shipping schemes that enable return of non-biodegradable solid waste to urban landfills.
	Maritime Safety Administration Act 2009: **25.** For the purposes of this Part, the Minister may make regulations for the purposes of applying, implementing and enforcing any international maritime convention or agreement and in particular for any purpose associated with - (b) the prevention or response to marine pollution; (c) the dumping or incineration of wastes at sea by vessels; and (d) the implementation of regional conventions and agreements relating to protection of the maritime environment and the regulation of shipping in the South Pacific region.
	Shipping (Marine Pollution) Regulations 2011: **15(1)** The Administration may approve and publish Standards and Codes of Practice in relation to the provision of waste reception facilities at Solomon Islands ports to regulate vessels in the discharge of waste oil or oily residues, hazardous and noxious substances and sewage from those vessels, and the disposal of their garbage.
	Fisheries Management Act 2015: **5(1)(j)** fishing and related activities shall minimise - (i) wastes, by-catch, discards, regulatory discards, economic discards and catch by lost or abandoned gear; (ii) pollution originating from fishing vessels or vessels engaged in related activities;
	Fisheries Management Regulations 2017: **24(1)** All fishing vessels must be marked and identified consistent with national and the FAO Standard Specifications. **24(2)** All floats, marker buoys and fishing gear of a fishing vessel must be marked so that fishing vessel can be easily identified from such marks. **33(1)** Each fish aggregating device deployed in the fisheries waters by a fishing vessel or by a Solomon Islands fishing vessel in areas beyond national jurisdiction must be: (a) clearly marked with the name of the owner and of the vessel from which the device was placed; (b) equipped with a radar reflector with lights that must be clearly visible at night from a distance of one nautical mile;
	Environment Act 1998:

Extended Producer Responsibility	8. The Director shall in every three years submit a report on the state of the environment to the Minister, who shall cause such report to be laid before the National Parliament. (2) The report may, inter alia, include - (d) an examination of trends in economic analysis and of cost-effectiveness of controls associated with any of its functions and responsibilities.
	National Solid Waste Management and Pollution Control Strategy (2017 - 2026): Overarching principles: Extended producer (importer) responsibility principle — The strategy encourages producers/importers to bear a degree of responsibility for the environmental impacts of their products. It includes upstream impacts arising from the choice of materials and manufacturing process and downstream impacts from the use and disposal of products. Extended producer responsibility (EPR) encourages producers and importers to consider the entire life cycle of their products. It is especially useful for products not easily recovered from the waste stream. EPR encourages businesses to prevent wastes at source, design products to be environmentally friendly and set up take-back and recycling schemes. **9.8** Financial instrument and sustainability Outcome: Have in place predictable and long-term financing mechanisms and economic instruments that secure the continuity and expansion of waste management and pollution control activities. **9.8.7** Undertake a cost-benefit analysis of options to implement polluter pay, extended producer/ importer responsibility, CDL programmes and a tourism tax as long-term finance mechanisms.

Appendix 5: Adoption of the three principles within national legislation – Vanuatu

Principle	Vanuatu instruments – explicit or inferred adoption
Polluter Pays	**Waste Management Act No. 24 of 2014:** DEPC to be responsible for "The collection and disposal of waste that cannot be managed by the normal waste collection services." (Part 2, 7 (5)) DEPC has responsibility: "to introduce programs for the collection and disposal of hazardous and bulk waste" (Part 4, 20 (2)(a))
	National Waste Management and Pollution Control Strategy and Implementation plan 2016-2020: To make waste management systems and programmes financially self-sustaining. (Establish incentive schemes that implement the polluter pays principle by encouraging cleaner production and waste recovery). PRINCIPLE 3: Polluter Pays Principle - Waste producers and polluters should pay the cost of managing their wastes, or cleaning up the pollution and remediating associated environmental damage.
	Vanuatu National Environment Policy and Implementation Plan 2016–2030 (NEPIP)

	PO 3.3: Establish incentive schemes that implement the polluter pays principle by encouraging cleaner production and waste recovery.
	Used Oil Management Plan 2014 Used Oil Stewardship System in Vanuatu - Adoption of the user pays approach: The costs associated with the collection, storage and re-use/disposal of used oil will be borne by importers, retailers, consumers and users of oil.
Best Practice	**Pollution (Control) Act No. 10 of 2013** 3. Functions of the Director (b) in the absence of relevant regulations, prepare guidelines and standards for the purpose of giving effect to this Act; 27. Regulations (1) Regulations may be made under this Act for the proper management and regulation of pollutant discharges and emissions and for the effective implementation of this Act. (2) Without limiting the generality of subsection (1), regulations may be made to: (e) prescribe standards, guidelines or codes of practice to give effect to any requirement under this Act.
	Waste Management Act No. 24 of 2014: **Part 6, 44 Regulations:** (1) The Minister may by Order make regulations not inconsistent with this Act for the better carrying out or giving effect to the provisions of this Act. (2) Without limiting the generality of subsection (1), the Minister may make regulations for any of the following purposes: (o) ensure the observance of approved standards, rules, operating procedures and codes of practices in force in accordance with this Act;
	Vanuatu National Action Plan to reduce releases of Unintentional Persistent Organic Pollutants 2018-2022: KRA3: Increase adoption of best practices in the waste management sector
Extended Producer Responsibility	**Waste Management Act No. 24 of 2014:** **Part 6, 44 Regulations**: **(1)** The Minister may by Order make regulations not inconsistent with this Act for the better carrying out or giving effect to the provisions of this Act. **(2)** Without limiting the generality of subsection (1), the Minister may make regulations for any of the following purposes: (r) provide for a Product Stewardship scheme to minimise the adverse effects of waste on the environment and the scheme may provide for any or all of the following matters: (i) prescribing the amounts for deposits, payments, fees and refunds; (ii) reporting and information requirements, including information to be provided to purchasers, users and handlers of the product the subject of the scheme; (iii) imposing responsibilities on producers, retailers, distributors, collection agencies and processors; **(4)** Product Stewardship Scheme means an incentive scheme: (a) in which producers who are involved in the life cycle of a product share responsibility for the management and impact of the product throughout its life cycle, including end-of-use management; and (b) that seeks to redress the adverse impacts of a product on the environment; producer means any person or legal entity that manufactures or imports items designated under a Product Stewardship Scheme for sale or distribution in Vanuatu.

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