

Chapter 9

Towards a Circular Logistics Partnership: Regional Trade, Waste, and Inter-Sectoral Cooperation



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How Governance, Science and Business are successfully working together to reduce the build-up of waste and no-longer-wanted goods in the Pacific Islands Countries and Territories.

Abstract Trade in the Pacific connects economies and communities, but also relies on profitmaking transactions. An outcome of this is that waste and no-longer-wanted goods build up on island nations and if not properly managed are directly detrimental to water resources and communities, and indirectly to tourism-driven revenue, upon which many Pacific Island Countries and Territories (PICT) depend. The logistics of distances exacerbates these issues. Careful analysis and leveraging slacks in the logistics systems helps not only improve economic efficiencies through recycling, but also reduce in situ waste streams. However, implementation of a circular logistics system requires strong partnerships between Governance, Science and Business working together. This chapter details a case study in the PICT to load empty shipping containers with refuse for recycling when they are relocated back to the Pacific Rim for reloading with more finished goods for import to PICT. Building on the above, a proposed project to manage the disposal of the increasing numbers of end-of-life vehicles, batteries, and other light grade metals in the Pacific will also be described. This is notwithstanding that the preferred method of avoiding disposal by abandonment is to legislate for Extended Producer Responsibility (through extended Advanced Disposal Fee (ADF) schemes) to engineer the issue away at source.

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9.1 Introduction

The Pacific Island Countries and Territories (PICT) are responsible for managing ~10% of the world's oceans, including a third of the Pacific Ocean. The logistics of distance and the lack of economies of scale, are compounding the issues of waste management in the PICT, wherein the wastes streams generated are beyond their capacity to manage. This is particularly more prominent in the case of plastics from packaging and/or designed as single use.

A large majority of the PICT (Fig. 9.1) are too small (in area or population) to justify financially viable recycling plants. The waste streams are often dumped in official, or unofficial, landfill dumping sites. However, the broader issue arises from the impact on the ecology and the changing climate (Chap. 5). The wastes are blown into the surrounding seas by extreme weather, such as storms and cyclones (which now occur in increasing and changing energy and frequency) that pass through the Pacific Islands. Wastes are then ingested by the marine life that the islanders rely on to survive and makes its way up the food chain to the Pacific Islanders. Recent studies show that microplastics have entered human digestive systems, and nanoplastics have entered the human blood system.

There are competent, licenced recycling plants around the Pacific Rim. But the small scale and low value of the waste streams *in situ* means that once all the additional costs of shipping to the Pacific Rim are factored in, it becomes a loss-making venture to send the waste to responsible recycling facilities (Chap. 10). Consequently, the waste remains on the PICT and:

- (a) Degrades the environment visually, reducing the tourism value.
- (b) May leach toxic chemicals into the marine and land environment, harming the people, flora and fauna locally.
- (c) Occupies often scarce land, that could have been better used for agriculture or for other economic production.

On realizing that Swire Shipping (formally The China Navigation Company [CNC Co], which changed name to Swire Shipping Pte. Ltd. [SSL] on the 15th October 2021) (SWIRECNCO 2022) was contributing to the problem by transporting finished, packaged goods into PICT, Swire Shipping took the initiative in collaboration with the Secretariat of the Pacific Regional Environment Programme (SPREP) (SPREP 2022) to help resolve the issue. SPREP is the regional organization responsible for protecting and managing the environment and natural resources of the Pacific Island states. After significant analysis of the entire logistics systems, SSL determined that as it was repositioning the unloaded, empty containers back to the Pacific Rim (to reload more finished goods), it could also be a part of the solution by shipping waste

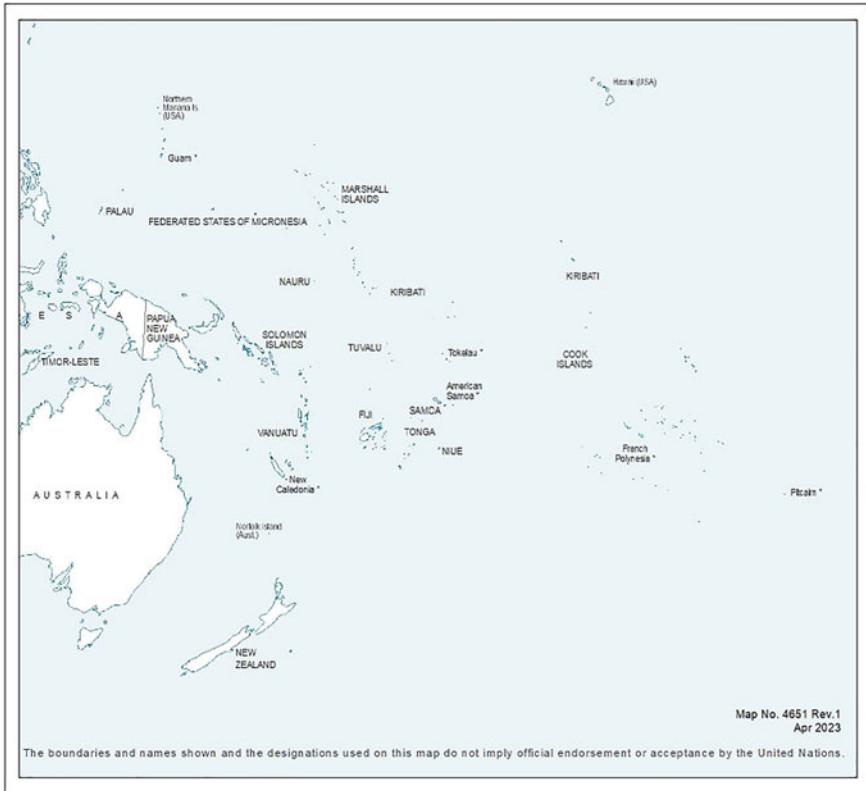


Fig. 9.1 Pacific regional map, adapted from UN Geospatial (2023)

that was collecting in the PICT back out to responsible, competent, licenced recycling plants. This realization led to the Moana Taka Partnership (Moana Taka Partnerships 2022).

Though there have been research studies in waste logistics for food rescue (Nair et al. 2016, 2017a, 2017b), no such research papers were found with respect to maritime waste logistics. Therefore, careful analysis of such case studies is particularly important. A particular barrier in PICT is the availability of data. Despite this, the systematic approach to leverage existing logistics operations towards improving sustainability is an important case study, that cannot only potentially secure other logistics operations in PICT towards similar goals, but also more broadly globally as part of a public-private Partnership.

9.2 The Problem

With increasing affluence and adoption of urban lifestyles, the 43.7 million people living in the Oceania region, which includes PICTs as well as Australia and New Zealand, naturally and rightly expect higher living standards (see Chap. 14). This typically demands more imported goods, which tend to be consumables, such as food, household goods, electronic goods, and vehicles, and this inevitably leads to an increase in the amount of waste produced.

The situation is further exacerbated by the fact that the PICTs are limited in size and population and have few financially viable options to properly process or recycle waste on the islands. This means that land taken up by the waste could potentially have been better used for agriculture or towards raising economic capacity locally.

The waste that goes to landfill may affect islanders' health due to air pollution, or seepage into precious groundwater. However even if it does not affect the air or groundwater, the waste entering the sea inflicts damage on marine biodiversity. Marine life is a critical and integral part of Pacific Island culture, to the extent that Mr. Kosi Latu (SPREP Director-General 01 April 2022) argued, "*if they're gone, part of our culture is also gone.*" Environmental damage by pollution from liquid and solid wastes is hypothesized to have led to a substantial economic loss for the region.

The third United Nations Environment Assembly (UNEA-3) took place in Nairobi, Kenya in December 2017. The main thematic cluster of UNEA-3 was the "Clean Planet Pledge" with specific reference to ocean plastics and how to prevent them. The messages of the presentations given during that session were very clear:

1. PICT are heavily impacted by waste from local and global sources, with high dependence on imported products and with small-scale markets far from overseas recycling centres.
2. The plastics present in the oceans and on land in the PICT were being imported:
 - i. as onshore waste carried down rivers and entering the region on ocean currents, *and/or*
 - ii. as "Ghost Nets": the 6% of all fishing nets, 9% of all traps, and 29% of all lines are lost abandoned or discarded from fishing vessels each year, *and/or*
 - iii. as garbage from cruise and other ships, *and/or*
 - iv. as legitimate cargo, such as packaging for finished goods being imported on container/cargo ships.
3. The stark and unavoidable conclusion was that, shipping companies and cargo carriers, were part of the problem and needed to find a way to be part of the solution

Furthermore, there are international conventions regulating the transboundary movement of waste to stop its dumping. These are principally the Basel Convention, and the local PICT version that also forbids transport and dumping of nuclear waste, the Waigani Convention (Waigani Convention 2022). However, these conventions do

not forbid the transboundary movement of waste but *do* seek to regulate it, such as to ensure that the waste streams are properly, responsibly, and competently handled at the destination country.

9.3 The Solution

Swire Shipping owns, operates, and manages around 50 general cargo and container-ships serving 14 deep-sea or international trade routes in the Pacific Ocean (Fig. 9.2).

Swire Shipping carries a material portion of the finished goods that are imported into the PICT. A large portion of these have plastic and other packaging that is removed and disposed of once the goods reach the ultimate end user. As nearly all of the PICT are too small (in area or population) to financially justify viable recycling plants, these plastic/packaging waste streams are often then dumped into official or unofficial landfill dumping sites, many of which are shallow areas remaining after building materials have been extracted.

Swire Shipping then repositions the newly emptied containers on ships heading out of the central Pacific, generally back to Pacific Rim countries, to be loaded for the next inward voyage. It was very obvious that the waste streams that had previously been unviable to ship out for processing (until such time that local recycling plants are established), could be carried to the best destination. The containers owned by Swire Shipping that are typically rented to shippers at a daily rate, were made available *pro bono*. The freight charge (on a Free In Free Out basis) was also waived as the

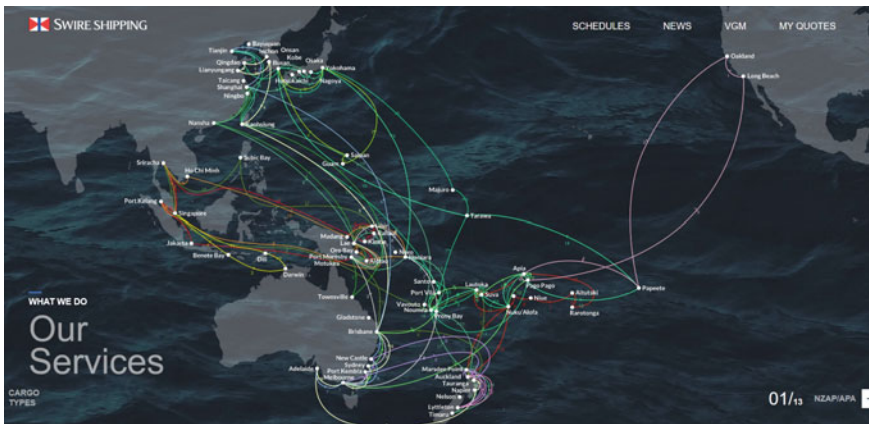


Fig. 9.2 Swire Shipping lines route map as at February 2023. The boundaries and names shown and the designations used on this map do not imply official endorsement or acceptance by the United Nations. (<https://www.swireshipping.com/information/info-pages/our-solutions/liner-shipping/>). Figure credit: Swire Shipping Pte. Ltd.

containers were needing to be re-positioned in any case. For no extra cost to either the waste stream “owners” or the shipping company, the waste could be carried out.

SPREP is the secretariat of the Waigani Convention and is the Pacific Regional Centre for the Basel Convention and is thus able to ensure that the required Prior Informed Consent, licenses, exemptions etc. are all in place for all relevant ports before any shipment of cargo is authorized and accepted.

In addition to the principal stakeholders, the PICTs’ national governments, the other key stakeholders comprise the shipping firm and owner of the empty containers, SSL, the regional Intergovernmental body for the Environment, SPREP, plus the Ministries of the Environment (or waste) and in some cases the Ministries for Tourism of the PICT. SPREP was crucial to facilitate the government-to-government interactions. At the same time, it can also connect potential investors and IGOs (e.g., UNEP, UN ESCAP, World Bank, Asian Development Bank, European Union) with the governments on environmental initiatives, such as developing suitable recycling plants.

Shippers of waste stream cargos were also one of the stakeholder groups. A potential shipper could be a recycling company, a non-governmental body, or a government agency. The typical month-long permit application process would be triggered by the shipper which had to reside in an exporting country that was a member of SPREP and/or the Pacific Islands Forum (PIF). The waste shipment exemption application is then made through SPREP.

The partnership between SSL/Swire and SPREP/UNEP was to engineer a “win-win” situation for the two parties, as well as the shippers, the exporting countries’ communities and the destination recycling plants. This was known as the “Moana Taka Partnership” (MTP). *Moana* is the Polynesian for ocean and *taka* is the word for circulate in Polynesian, and “waste” in Swahili. The MTP memorandum of understanding (MOU) signed on Global Recycling Day, 2018 established the operational processes by which SSL vessels carry their owned containers, lent *pro bono* to the shippers to fill with recyclable waste from eligible Pacific island ports (viz. on Swire Shipping’s route network, initially, to avoid complications of transshipment), to then be shipped with *pro bono* freight fees, so that the waste could be sustainably treated and recycled in suitable ports in Asia Pacific elsewhere on its route network.

Specifically, the MTP focused initially on moving cargos explicitly covered under the Waigani and Basel Convention, an agreement that regulates transboundary movement of defined toxic, poisonous, explosive, corrosive, flammable, eco-toxic, infectious, and radioactive wastes. Under this agreement, PICTs that have insufficient or inappropriate landfill space to store waste, inadequate waste treatment facilities, or lack the financial ability to ship recyclable waste are eligible to apply. Recyclable materials include plastics, aluminium cans, waste oil and ozone depleting substances (ODS), amongst those on the list in the Basel Convention. When the agreement initially took effect it did not support non-hazardous (but still non-commercial) shipments, but it has done so since mid-2019. The fourteenth meeting of the Conference of the Parties to the Basel Convention (COP-14, 29 April–10 May 2019) adopted amendments to Annexes II, VIII and IX to the Convention with the objectives of

enhancing the control of the transboundary movements of plastic waste and clarifying the scope of the Convention as it applies to such waste. The MTP was instrumental to SPREP in helping to deliver a part of its initiatives toward implementing its Cleaner Pacific goal by the year 2025 (Cleaner Pacific Strategy Plan 2022). It had set aside USD 4 million for waste management system in the region. As part of the MTP agreement, the regional organization could help identify a competent, licensed, willing, and suitable waste stream recycler/waste reception facility/buyer, unless the applicant for shipping the waste out from the Pacific Islands had already identified one.

The UN Environment Programme (UNEP) is the international agency that coordinates the UN’s environmental activities, helping developing countries to implement environmentally sound policies and practices. UNEP supported this partnership, and found that it held the potential to help realize several of the UN’s Sustainable Development Goals (SDG) which had been promoted since 2015; in particular the three goals shown in Fig. 9.3.

For Small Islands Developing States (SIDS) it is noteworthy to mention, that the Biosphere Reserve of the Island of Príncipe (São Tomé and Príncipe) and UNESCO have launched an awareness and mobilization campaign entitled ‘No plastic. A small gesture in our hands’. The campaign follows one of the resolutions of the International Meeting of the East Atlantic Biosphere Reserve Network, which took place on the Island of Príncipe in May 2013, and aims to reduce plastic waste and promote access to drinking water in the biosphere reserve. The campaign intends to involve the whole population in collecting plastic bottles. Fifty plastic bottles can be exchanged for a ‘Príncipe Biosphere Bottle’, a reusable stainless-steel bottle made from safe,



Assisting PICTs with sustainable consumption by reducing waste to air and to landfills, increasing national recycling rate and adopting product life cycle approach to resource management.



By removing toxic waste in a controlled manner this project will reduce marine pollution from land based activities which in turn leads to protection of the marine and coastal ecosystems.



Reducing toxic and slow degradable waste to landfills helps to reduce negative impact on terrestrial and inland freshwater ecosystems and their services as well as assisting with the loss of biodiversity.

Fig. 9.3 United Nations Sustainable Development Goals

plastic-free materials. These bottles can be replenished at various treated water points installed across the island of Príncipe.

9.4 The Agreement

Through the good offices of SPREP and the Pacific Island Forum (PIF), in contact with the various PICT national Ministries’ of the Environment, there is now a wide knowledge of the MTP amongst those whose business concerns disposal of waste streams. Prior to the introduction of MTP, waste streams had a negative profitability when shipped commercially from places with no disposal facilities to the ports where disposal could be done in a licenced, competent, and sustainable way. The entire negative profitability equation is turned on its head when both the container hire costs and freight charges are waived by the shipping company relocating the empty containers, which it has to do anyway.

A copy of the flow chart for the MTP Charter is shown in Fig. 9.4.

The owner of the waste stream must:

- 4.1 First determine if this partnership offer will be applicable in their county and national circumstances.
- 4.2 Submit an application form which outlines the type of waste stream (hazardous or non-hazardous), the location and the quantity, the condition, the current owner, and the preferred timescale for removal.

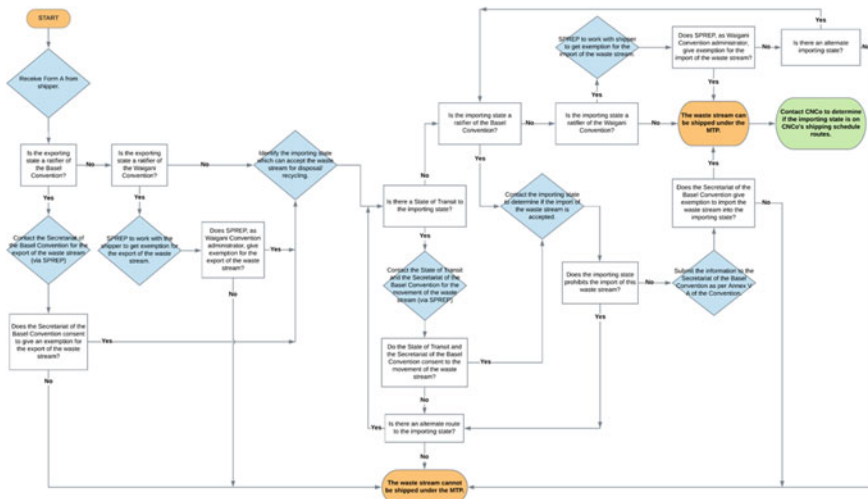


Fig. 9.4 The MTP Charter and Process (source The Moana Taka Partnership Charter; <https://dcasvmm70pnz.cloudfront.net/assets/Sustainability/The-Moana-Taka-Partnership-Charter-Rev-2.3-Non-commercial.pdf>). Figure credit: Swire Shipping Pte. Ltd. and SPREP

- 4.3 Provide the name and location of competent, licensed, willing and suitable waste stream recycler (for which SPREP is able to provide assistance if needed).
- 4.4 Critically warrant that the waste shipment is *non-commercial*. This is interpreted as “the waste stream has not been shipped between the ports involved within the past two years”. This is to prevent this environmental and social initiative cannibalizing existing commercial bookings that have been carried out previously without any need for a subsidy. This could commercially disadvantage both the shipping company and other waste shippers who have been paying to ship the same waste stream up to the development of the MTP.

Swire Shipping will then review the application form to determine:

- 4.5 If they have any suitable empty containers in a port near the waste location that need to be moved to a port near the recycling location.
- 4.6 If they have any suitable ships serving the port pair in 4.3.
- 4.7 If they have space to transport the container from and to the port pair in 4.3. Assuming yes, then
- 4.8 the MTP dedicated resource will then liaise with the owner of the waste stream to make a cargo slot booking.

SPREP, as the Pacific Regional Centre of the Basel Convention/Waigani Convention Secretariat, will then:

- 4.9 liaise with the shipper, consignee, shipping booking department, and ALL countries on the route between the port pair in 4.3 (viz. departure, intermediate, and destination ports) to obtain Prior Informed Consent under the Basel/Waigani Convention, *if* the cargo is on the hazardous cargo lists in the convention schedules.

When (and only when) all the above administration is complete can the operation begin.

The shipper has the responsibility for arranging and paying for all matters such as filling the containers, transport to the port, loading onto the ship, issuance of bills of lading and securing any necessary insurance prior to loading, and also the arrangement and payment of importation fees (including manage bio-security issues where relevant), moving away from the port, storage, unstuffing, and container cleaning after discharge at the destination port. It must also be noted that it is not always possible for such *pro bono* shipments to be performed from all points, to all point as may be preferred by the shippers.

Currently the company cannot ship to ports outside the Asia–Pacific, or destinations not covered by its schedule routes, as it cannot commit 3rd party Ship Owners to provide *pro bono* services. However, and crucially, this partnership is not seen as a revenue line item, but rather an environmental and social investment in its key communities. Consequently, the processes involved are all available, in editable format, for any other like-minded ship owners to rebadge and copy the MTP. Swire Shipping reports that that this has begun to happen in the Pacific Ocean for other PICT not served by Swire Shipping, and is being

reviewed by UN Environment for replication for SIDS in both the Indian Ocean and the Caribbean Sea in conjunction with the GEF-funded ISLANDS Waste-free Shipping Programme (see GEF ISLANDS <https://www.thegef.org/newsroom/press-releases/island-nations-get-new-lifeline-beat-pollution> 2022). This demonstrates the successful public–private partnership offers continued opportunity for replication and growth.

9.5 The Impact

The first shipment (SWIRECNCO Waste Shipment 2022) took place in March 2018, just 115 days from the meeting under an acacia tree at UNEA-3 and when the ink on the MTP agreement had barely dried, on the Swire Shipping vessel, *MV Melanesian Pride*, from Apia, the capital of Samoa, carrying 2 TEUs (twenty-foot equivalent units) with 56 tonnes of scrap metal, to Brisbane, Australia.

Since then, in 2019 the MTP shipped 50 TEU / 616 tonnes from Australia, Fiji, the Marshall Islands, and Papua New Guinea (PNG), to Australia, Kiribati, Malaysia, Samoa, Singapore, and Vietnam.

A few barriers were discovered including:

- one existing waste shipper felt strongly that his business, which he had built up over years, was being harmed. Swire Shipping attempted to engage with the individual, pointing out that no single “commercial cargo” had been shipped, viz. “a waste stream has been shipped between the ports involved within the past two years”, but to no avail.
- one shipment for which the consignee’s waste recycling permit expired on the voyage, so the destination port customs would not allow it to be landed (requiring Swire Shipping return it to its port of origin at its own cost). A longer buffer is now set in place to avoid this. The use of requesting a bank bond to cover the costs of returning the shipment to the loading port is being considered, but has yet been instituted.

However, the scalable model and the material impact that garnered broader support, has meant that other shipping companies in the Pacific have begun to adopt this model. If the take-up develops further in this way, it is possible that the partnership can be expanded to encompass movement of waste streams to an expanded destination port network by using two separate shipping lines, with trans-shipment at an intermediate port (in exactly the same way as baggage transfers are possible between two airlines in the same alliance who agree to “inter-line”). UNEP is considering transferring this model to other ocean basins such as the Indian and Caribbean Sea.

9.6 The Future

One issue that has been very visible as Swire Shipping has taken a deeper interest in under/improperly processed waste in PICT, is the number of abandoned End of Life Vehicles (ELV) observed on every island. To reduce the volume of discarded waste materials, particularly ELV in the PICTs, an integrated logistics supply chain and recycling operation that will enable the ongoing recycling of various waste streams that is sustainable both financially and environmentally is needed.

Geographic presence and logistics network coverage to deliver sustainable outcomes for the communities of the PICTs, now and for the future is critical. Future plans can build on the learning from this partnership.

- Build from the Moana Taka Partnership (MTP), a proven successful, innovative regional project.
- It is regarded as a scalable project due to the number of satellite plants and the capabilities of our network.
- The project is targeted to scale; starting with the recovery of waste irresponsibly discarded in an environmentally unfriendly manner aiming to eventually see proactive final owners delivering to commercial and industrial (user pays) sites, and thus assisting in the recovery and recycling of mining and other industrial users.
- It is intended that this will eventually be a commercially viable project for all stakeholders, rather than solely an environmental/CSR project.
- It will create employment, skills, and enrich the lives of local people.
- Target a measurable reduction, and eventually a complete avoidance of material sent to landfill, while maximizing the closed loop recycling of a variety of materials that are currently just seen as waste streams.

There is an imbalance between the levels of import and exports in the PICTs, and this has resulted in large numbers of ELVs and bulky domestic appliances being abandoned in the region. The Swire MTP proposition detailed earlier is to ‘do better’ with them.

Appropriate disposal to landfill or for resource recovery is currently unsustainable in the PICTs due to the constraints of their wide geographic distribution, the low value and low volume of the scrap available, distance to the relevant markets, lack of public funding, specialist skills, or enterprise to do better, and the presence of Persistent Organic Pollutants (POPs) as flame retardants in the ELV soft fittings that must be removed prior to recycling to mitigate leakage of toxic compounds into the environment. The aim of the partnership is to ensure on-going delivery of best practice waste minimization methods and best possible outcomes for the environment and the PICTs communities.

However, it is clearly recognized that cleaning up irresponsibly abandoned ELVs is a reactive solution aimed at treating the symptoms and not the cause. It is believed that IGOs helping the PICTs enact legislation that suits them, to encourage

responsible disposal at the end of life of the asset will be a material improvement, building off the work that the likes of SPREP have done in the past with the Extended Producer Responsibility (EPR) (Extended Producer Responsibility 2022), the circular economy, the life cycle approach and all the other efforts they have made in the past. The authors' view is that Advance Disposal Fees (ADF) (Advanced Disposal Fees 2022) are the next step on road to the behavioural change, albeit an important one.

It is believed that ADFs are a relatively new concept in the PICTs, with the exception of Tokelau where the idea has yet to be fully developed. It may well be some time before there is any legislation put in motion as a result of Tokelau's leading work in this area. However, if SSL's "Project Rivendell" gets the go-ahead, legislation will greatly help to progress this solution. The ownership of the abandoned scrap in each country is a potential obstacle to the viability of this project, as it would be in any region. To overcome this, the project will need support from local governments.

While it would of course be possible for each of the PICTs to set up the legislation individually themselves, we feel this may be inefficient, re-inventing the same wheel. The legislation should be quite similar from country to country, so adopting a similar package avoids the cost in time and money for each single country and territory. The end result of adopting non-common legislation will be to delay the implementation of the project and the clean-up of the islands.

Most businesses in our sector do not involve themselves in lobbying government; it is not Swire Shipping's desire, or core business or area of expertise. This is where public-private partnerships with inter-governmental bodies, based on the data-backed science and business operations can once again work together to produce a solution that gives wins to the three parties in the Science-Policy-Business area and the key stakeholders of the communities of the PICTs.

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