

# Plastic Waste Free Islands



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PROOF OF CONCEPT

BOTTLE-TO-BOTTLE RECYCLING VANUATU

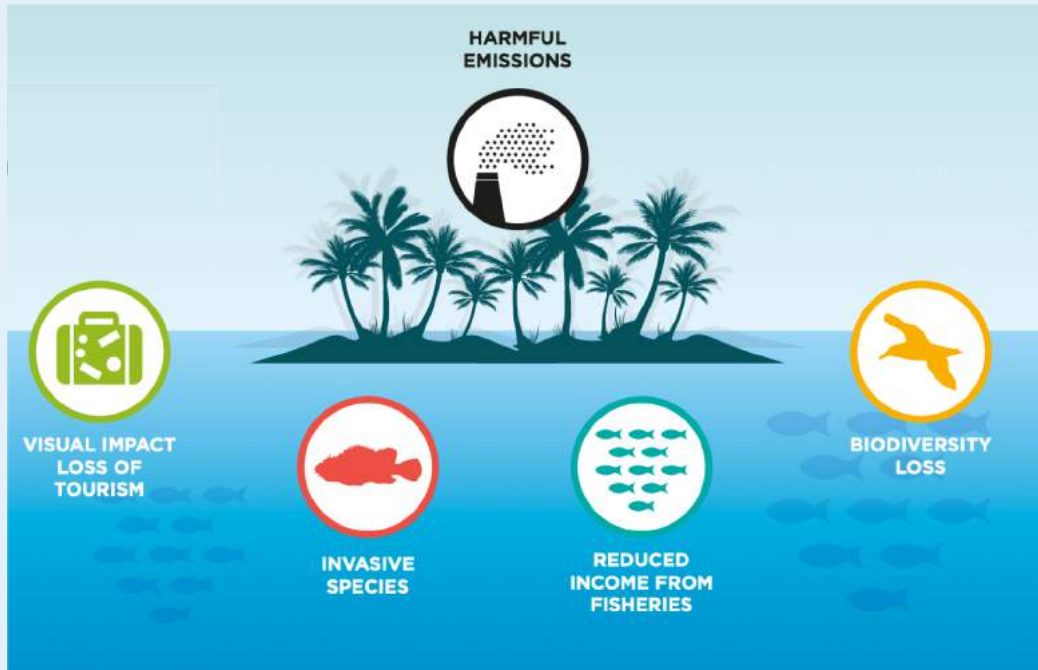
An initiative supported by Norad  
managed by IUCN and  
co-implemented by Serious Business

# Vanuatu

## GENERAL STATUS OVERVIEW & SECTORAL DATA



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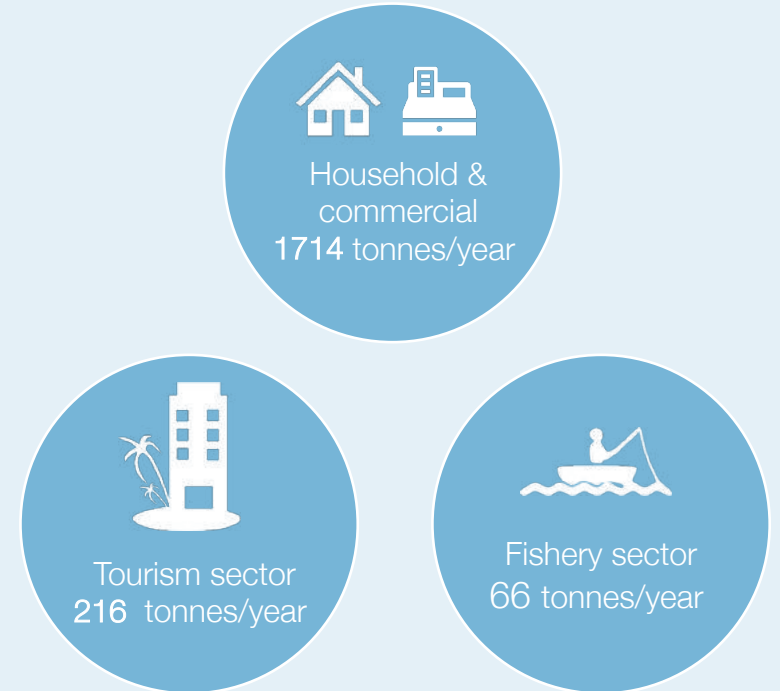
	Annual Imports 2018-2019 (T/y)	Total disposed 2019 - landfill (T/y)	Leakage (T/y) (95% credible interval)	Leakage (%) (95% credible interval)
PET (1)	859	336	454 (86-656)	49% (9%-72%)
HDPE (2)	745	166	468 (192-633)	67% (28%-92%)
PVC (3)	144	36	69 (16-107)	56% (13%-87%)
LDPE (4)	672	488	463 (29-741)	41% (3%-67%)
PP (5)	440	127	296 (133-404)	64% (29%-88%)
PS (6)	453	214	296 (60-427)	55% (11%-79%)
Other (7)	1385	197	799 (439-960)	76% (42%-92%)
Overall	4698	1564	2846 (938-4018)	58.8% (19%-82%)

National plastic waste generation & leakage data Vanuatu

# Vanuatu

## GENERAL STATUS OVERVIEW & SECTORAL DATA

- ❖ Prepaid bag collection at source, no segregation at landfill, no local plastics recyclers → landfill, or leakage
- ❖ Recyclers and relevant business partners united in the Vanuatu Recyclers Waste Management Association (VRWMA)
- ❖ Key developments:
  - Wan Smol Bag, No plastic bag, plis, Mama's Vanuatu, Pango Green Force and 300 Coconut bag.
  - The Department of Environmental Protection & Conservation (DEPC) is working with SPREP-PAC Waste Plus on exploring W2P solutions
  - Advanced Recovery Fee system policy paper is being developed by VRWMA for recyclables, incl PET and possibly HDPE
  - Vess/Recyclecorp/VRWMA in collaboration with World Vision Vanuatu clean up campaign June 2021
  - RecycleCorp and PWFI PET export trial to Visy, Australia



**2370.58** tonnes plastic waste generated/year

# Targeted material

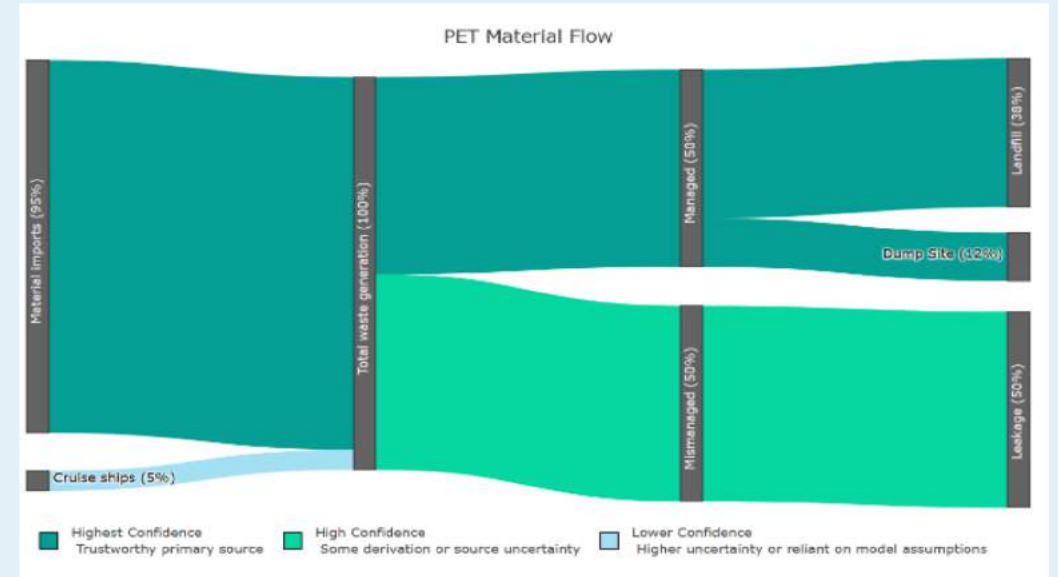
## PET – CURRENT VALUE CHAIN



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	Plastic Waste Generation	Household (t/y)	Commercial (t/y)	Tourism (t/y)	Fisheries (t/y)	Total (t/y)
PET 1	water bottle	5.6	67.18	No data	14.23	87.0
PET 1	beverage containers not water pet	0.0	14.17	No data	3.53	17.7
PET 1	food semi rigid containers eg trays pet	100.1	9.33	No data	0.00	109.4
PET 1	single use take away food containers pet single use	200.2	5.33	No data	0.40	205.9
PET 1	shampoo body wash pet	6.5	1.64	No data	0.00	8.1
PET 1	cooking oil pet	0.5	0.57	No data	5.50	6.6
PET 1	cleaning agent products pet	35.0	0.00	No data	0.00	35.0
PET 1	beauty and personal care pet	6.7	0.00	No data	0.00	6.7
PET 1	other pet	0.0	0.00	No data	0.00	0.0

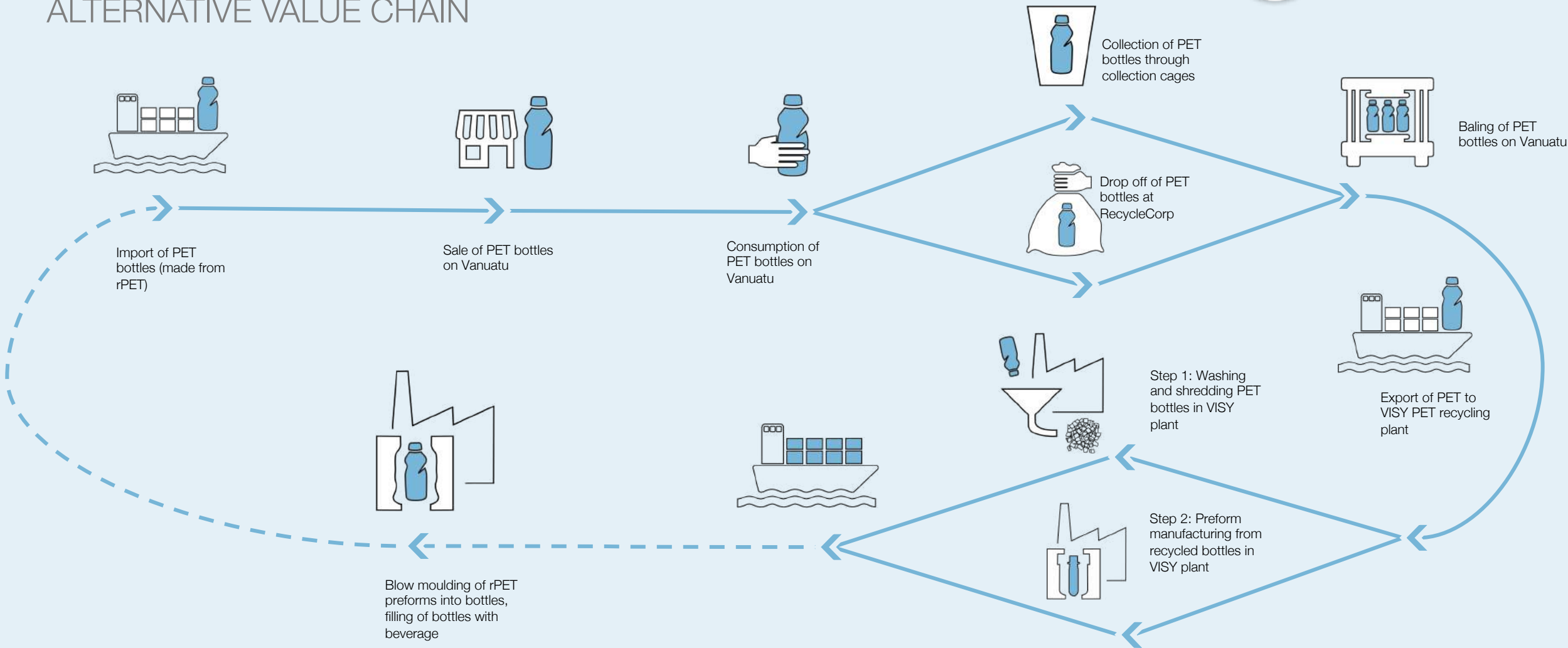


# Outline Bottle to Bottle Recycling

## ALTERNATIVE VALUE CHAIN



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# Outline Bottle to Bottle Recycling



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## RECYCLING PROCESS

### COLLECTION



- Manned collection points to ensure high level of efficiency and quality – combine with deposit return scheme including other materials used for beverage containers like HDPE, aluminum, liquid paper board etc.
- Separation of PET at source – distinction based on colors (transparent – light blue – other)
- Tracking of collected PET through log sheet, validation by weight and four-eye principle

### TRANSPORT



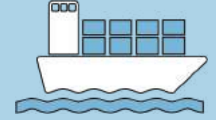
- Transportation by truck/van to processing facility
- Transportation is part of the value chain – therefore part of the tracking and validation
- If combined with deposit return scheme, high return rates can be expected – required transport on daily basis
- Could possibly be combined with RecycleCorp's activities

### PROCESSING

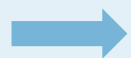


- PET gets baled (preferably with high-density baler), alternatively with metal compactor (optional: shredding of PET –possible when recycler has built trust in material)
- No liquids can stay in the bottles
- Caps and labels can stay on if they meet Design for Recycling Guidelines (no toxic adhesives in glues, no metal in labels/caps)
- Density goal of bales: 284 kg/m<sup>2</sup>
- Costs of labor and material

### EXPORT



- Export to food grade recycling plant, e.g. VISY in Australia
- Ensure stable, high quality to avoid negative business case because of high export costs
- Export to Australia: Biosecurity standards really strict –comply with all requirements (fumigation/quarantine) is crucial
- Import of preforms made from recycled content to close the loop (incentivize incorporation of recycled %)



**KEY ENABLING FACTORS:** Container deposit scheme, high-quality material, food-grade recycling plant

# Outline Bottle to Bottle Recycling

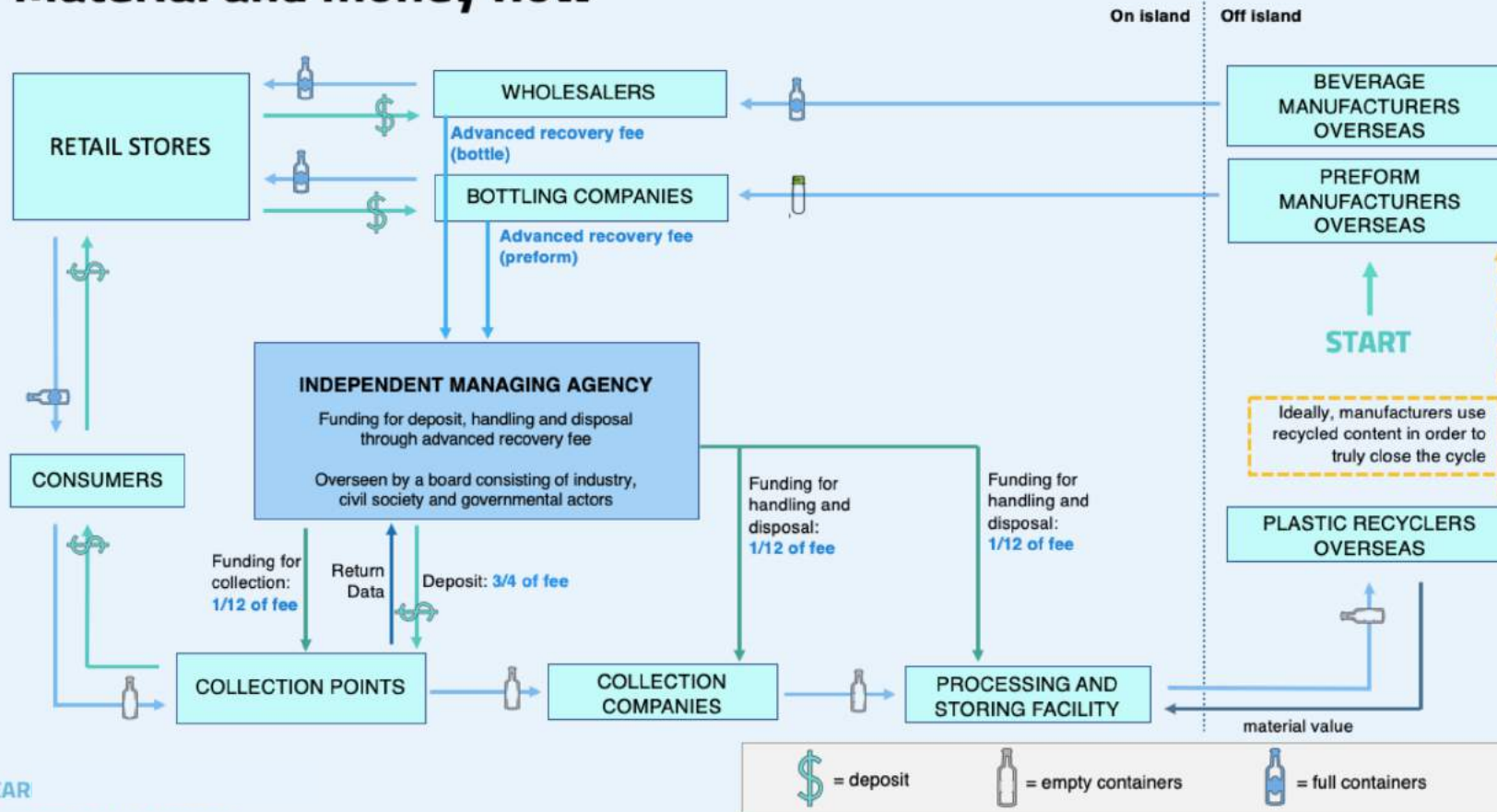


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## DESCRIPTION ADVANCED RECOVERY SCHEME

### Material and money flow



# Advanced Recovery Scheme

## HOW TO FINANCE THE INDEPENDENT MANAGING AGENCY

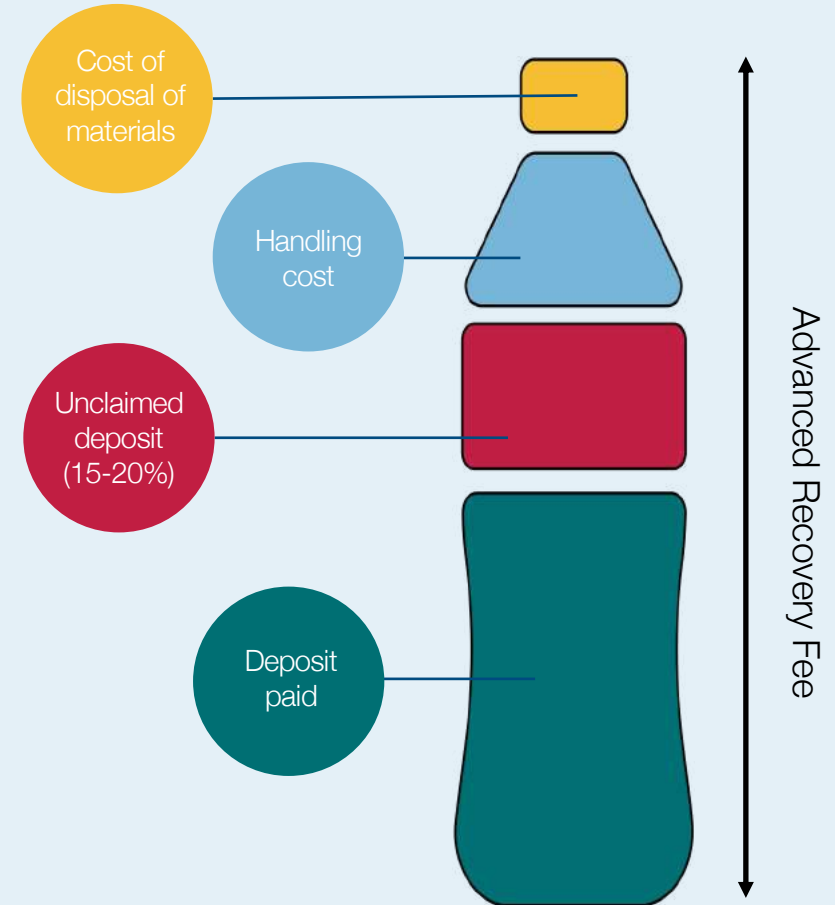
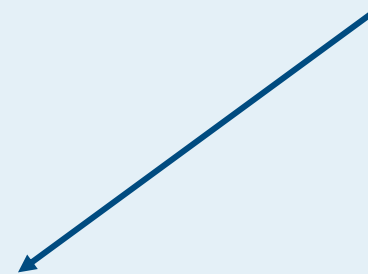


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- ❖ For the implementation and viability of the system on Vanuatu, we suggest to adjust the current levy tax.
- ❖ It needs to cover all the costs of activities necessary to uphold the system, while not putting too much pressure on local manufacturers and importers of items falling under the levy

Usually, about 15 – 20% of bottles are not getting returned. These unclaimed deposits can additionally finance the managing agency





# Factsheet



## MARKET ANALYSIS, COST OVERVIEW, USP

### Major applications and markets

- Major market: Preforms made from 50% to 100% recycled PET - Food-grade PET bottle have highest revenues
- Alternative markets: non-food PET bottles, strapping, sheets
- Markets for used PET bottles: Australia (e.g. VISY), New Zealand (through Broker)
- Markets for rPET preforms: rising global demand through changing legislation in multiple countries

### Volumes to be exported

- 40ft container
- e.g. VISY requires at minimum one full 20ft container of baled PET bottles, but prefers to 40ft container (16 tons)

### Source

- Used transparent and light blue PET beverage bottle, blow-molded. Manned sorting and cleaning for stable and consistent flow of PET bottles

### Costs and capacities

- Revenue: 500 AUD/ton of PET, 75 tons/year. See costs & revenues per stakeholder on next slide
- Collection: 34 h / month
- Transport: 7 h / month
- Processing: (washing, sorting, shredding: 40 h / month
- Export: once per month

### Unique selling points

- Meeting recycling targets of beverage manufacturers
- Concept allows for high-standard export of valuable materials
- Meeting circularity/sustainability targets of governments
- Scalability: e.g. VISY Australia processes 80-100 tons of PET per day – room for more.
- Marketability: Completely circular product, based on high readiness level from key stakeholders
- Risk & compliance: health and safety compliant local setup of processing

# Factsheet



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## COST BENEFIT ANALYSIS ALL STAKEHOLDERS

➔ Calculations based on **4.160.000 PET bottles** being released into the Vanuatu market per year. Envisioned recovery rate: 75% (**3.120.000 PET bottles**)

	Step	Description	Costs / annual PET bottle release (in VT)	Costs / annual PET bottle release (in USD)	Costs per bottle (in USD)	Comments	Paid / received by					
							bottlers / importers	collection point operators	transport companies	processing companies	managing agency	
Advanced Recovery Scheme imposed on responsible producers			43077625	450567.5	0.125	this translates to an advanced recovery fee of 14 VT per PET bottle	-450567.5					450567.5
Costs covered by Advanced Recovery Scheme	First part: Deposit	Deposit on each bottle of 5 VT	20800000	228800	0.055			228800				-228800
	Second part: Collection	operating collection points (labour)	10080000	110880	0.036	In order to achieve the envisioned collection rate, 8.548 PET bottles must be collected per day. If 10 collection points are being established, each has to collect 855 PET bottles per day (106 PET bottles per hour per collection point). 40.320 hours of work are needed for collection (based on 2 persons per collection point, 8 hour shift every day). 40.320 hours * 250 VT (above minimum wage)			110880			-110880
	Third part: Transport	Pick-up from collection points	313500	2850	0.0009	One 40ft truck fits 42000 PET bottles. In order to achieve the envisioned collection rate, 75 truck trips are needed annually. Assumption: 30 km one-way between collection point and recycling facility: costs for gasoline: USD 18; costs for labour: USD 20 (2 hours). This totals up to 38 USD for one truck trip from collection point to recycling company				2850		-2850
	Fourth part: Processing	Handling costs - unloading vehicle	216562.5	1968.75	0.0006						1968.75	-1968.75
		Sorting & Baling - labour	5775000	52500	0.017	Based on input from WRFL and compared to Antigua and Barbuda scheme, Labour costs of VT 250/hour. Bale size is 1 m3 and the density requirement is 284 kg/per m3					52500	-52500
		Sorting & baling - supplies stockpiling costs	1443750	13125	0.004						13125	-13125
			1082812.5	9843.75	0.002						9843.75	-9843.75
		export costs	2376000	21600	0.007	based on 3600 USD per 40ft container (fits 16 tonnes of baled PET bottles) 6 containers per year are required for 75% recovery rate						
	Management	Personnel costs for managing agency	660000	6000	0.00192	2 people in charge, full time						6000
		Promotion (material costs)	330000	3000	9.6E-04	for radio/TV ads, information material						
Total costs			43077625	450568	0.125		-450568	228800	110880	80288	36600	




# Factsheet

## BENEFITS



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Financial benefits 	Environmental benefits 	Social benefits 
Revenues: 500 AUD/ton of PET	Lower landfill pressure for government. Amount of plastic waste diverted based on 75% collection rate with container deposit scheme: 78.5 tonnes/year = 18% of all PET waste generated on Vanuatu	Develop domestic recycling market - Create more jobs in island in collection, sorting, cleaning, recycling – 20 FTE when converting 18% of all PET waste
Attracting sustainable investors/investments	Around 30% reduction of global warming, fossil resource scarcity and terrestrial acidification compared to landfilling PET bottles	Contribution to cleaner island and attractiveness for local population and visitors
Lower waste disposal and clean-up costs for government	Marine ecotoxicity reduced by > 50% compared to landfilling PET bottles	Human toxicity reduced > 50% compared to landfilling plastics
	Reduced amount of plastic waste that might leak into the environment: 78.5 tonnes/year = 18% of all PET waste generated on Vanuatu.	

# Plastic Waste Free Islands

*Let's catch the circular wave together*



IUCN\_Plastics



plastics@iucn.org



<https://www.iucn.org/theme/marine-and-polar/our-work/close-plastic-tap-programme>

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#ClosethePlasticTap



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SeariousBusiness



connect@seariousbusiness.com



<https://www.seariousbusiness.com/islands>

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#PlasticWasteFreeIslands #CloseThePlasticTap



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