Pacific Regional Recycling Centre: Scoping Study

Presented by Stewart Williams | Project Team Leader
& Marine Plastic Solutions Managing Director
Marine Plastic Solutions (MPS)

Aims to bridge the gaps between those with the potential to help improve and protect the environment and those countries that are in need of such assistance through tailored solutions.

Our team has worked throughout Australia, Europe, the Asia-Pacific Region, the Caribbean and Africa on a variety of waste related issues including, solid waste, hazardous waste, healthcare waste, e-waste, shipping waste, and plastic.

Takes a multidisciplinary and intersectional approach to all our work to deliver comprehensive and tailored solutions to complex problems in waste that fully incorporate linked social challenges such as gender equity, education, and poverty.

Is an inaugural Member of the ANZPAC Plastics Pact and works on a range of plastics and recycling initiatives in the Pacific region.
Our Role in the Project

• Together with our partner COWI we commenced the PRIF prefeasibility study investigating the viability of a Pacific Regional Recycling Hub to improve recycling in the Pacific island countries, care for the environment, create jobs and improve the economy?

• We have so far completed:
  • The Inception Report: Detailed workplan; approach and methodology; initial waste audit data analysis; and comments on the TOR
  • The Market Assessment Report: Analysis and findings of the regional recycling potential, market assessment of potential buyers vs volume to make it economically viable or level of subsidy required for viability
  • The Options Report: Details of the options and the results of the options assessment for consideration by the working group

• We are now working on:
  • The Draft Final Report: Draft pre-feasibility of the selected option for the recycling hub, including a roadmap for the establishment of a Pacific Regional Recycling Network
  • Final Report: Revised DFR based on feedback and comments of the working group
The Project: Option 3 - Combination

Stewart Williams | Project Team Leader

Key Features
- Investment Cost: USD 237.12 million
- Internal Rate of Return (IRR): 27.9 percent
- Net Present Value (NPV): USD 678.31 million
- Cost Benefit Ratio: 1.50
- Jobs Created (1st Year): 4,724 Construction, 2,371 Operational
- Greenhouse Gas: 1.59 million tonnes avoided

Waste Stream Composition - 549,828 Tonnes Per Year
- Aluminium Cans: 12.5% (68,575 t)
- Ultrapure Lube Oils (ULAB): 1.3% (7,014 t)
- PET: 4.4% (24,212 t)
- Scrap Steel: 52.9% (290,716 t)
- Steel Cans: <0.0% (14 t)
- Paper & Cardboard: 28.4% (156,321 t)
- Glass Bottles: 0.1% (371 t)
- Plastic Bags: 0.5% (2,607 t)

E/SE Asia
- PNG
- SLB
- VUT
- FSM
- ANZ
- US

Combination Hubs
- 1-4 Int/1-2 Reg routes per port
- 5-8 Int/3-4 Reg routes per port
- 8+ Int/5+ Reg routes per port

5000 TEU
50,000 TEU
<table>
<thead>
<tr>
<th>Options</th>
<th>Option 3</th>
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</thead>
<tbody>
<tr>
<td>Location</td>
<td>Fiji Hub/National Hub</td>
</tr>
<tr>
<td>Countries Included</td>
<td>Cook Islands, Fiji, FSM, Kiribati, RMI, Nauru, Niue, Palau, PNG, Samoa, Solomon Islands, Tonga, Tuvalu, Vanuatu</td>
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<tr>
<td>Type Waste Products Processed</td>
<td>Aluminium, ULAB, PET, Paper &amp; Cardboard, Plastic Bags (Plastic Film)</td>
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<tr>
<td>Type Waste Products Produced</td>
<td>Metal Ingots, hot washed plastic granules, intermediate paper cardboard product (Fiji Hub/PNG)</td>
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<td></td>
<td>High Compaction Bales (all other countries)</td>
</tr>
<tr>
<td>Type of Waste Facility</td>
<td>Receival Location(s), storage/receival bays, equipment buildings, furnaces, battery reprocessing units, paper/cardboard pulpers, ingots castors, cardboard moulds, comminution device, compactors, bailers, plasma cutters, forklifts, pallet scales, collection vehicles, collection bins (cardboard, plastic bags/film especially), equipment spares, power supplies, admin equipment</td>
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<tr>
<td>Volume (t)</td>
<td>549,828</td>
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<tr>
<td>Value of the recyclables (mil. USD)</td>
<td>$293.228</td>
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<tr>
<td>Potential markets</td>
<td>Asia (lead ingots, Aluminium ingots, PET Plastic pellets, Plastic Film pellets)</td>
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<td></td>
<td>Australia (Scrap Steel, PET and LDPE pellets, Cardboard/paper pulp)</td>
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<td></td>
<td>New Zealand (Cardboard/paper pulp)</td>
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<td></td>
<td>Pacific Is (lead for batteries, aluminium for input to extrusion products, cardboard/paper pulp for boxes, egg cartons, compostable plant pots, briquettes, glass for construction sand)</td>
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<tr>
<td>EBIT (mil. USD)</td>
<td>$67.78</td>
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<td>NPV (mil. USD)</td>
<td>$678.31</td>
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<tr>
<td>IRR</td>
<td>27.9%</td>
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<tr>
<td>Investment cost in total (mil. USD)</td>
<td>$237.16</td>
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<tr>
<td>Annual operating cost (mil. USD)</td>
<td>$225.45 (includes transport)</td>
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<tr>
<td>Transport cost (mil. USD)</td>
<td>$134.53</td>
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<tr>
<td>NPV of Financial Benefits (mil USD) 20 Years</td>
<td>$3,840.67 (excluding subsidies)</td>
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<tr>
<td>ENPV of Economic Benefits (mil. USD) 20 Years</td>
<td>$5,028.57</td>
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<tr>
<td>Benefit/Cost Ratio</td>
<td>1.50</td>
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</table>
## Country Material Scope

<table>
<thead>
<tr>
<th>Inclusions</th>
<th>(1) Aluminium Cans</th>
<th>(2) ULAB</th>
<th>(3) PET</th>
<th>(4) Scrap Steel</th>
<th>(5) Steel Cans</th>
<th>(6) Paper &amp; Cardboard</th>
<th>(7) Glass Bottles</th>
<th>(8) Plastic Bags</th>
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</thead>
<tbody>
<tr>
<td>Cook Islands</td>
<td>Export</td>
<td>Export</td>
<td>Export</td>
<td>Export</td>
<td>Export</td>
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<tr>
<td>Fiji</td>
<td>Export</td>
<td>Export</td>
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<td>National Use</td>
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<td>FSM</td>
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<td>Kiribati</td>
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<td>National Use</td>
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<td>RMI</td>
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<td>Nauru</td>
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<td>National Use</td>
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<td>Niue</td>
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<td>National Use</td>
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<td>Palau</td>
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<td>PNG</td>
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<td>Samoa</td>
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<td>National Use</td>
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<td>Solomon Islands</td>
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<td>Tonga</td>
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<td>Tuvalu</td>
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<td>Vanuatu</td>
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<td>Export</td>
<td>National Use</td>
<td>Export</td>
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</table>

**Key**
- **Hubs**
- **Feed-in**
- **Enhanced**
- **Improved Compaction**
- **No Business Case**
- **Business Case potential with subsidy expansion**

*Stewart Williams | Project Team Leader*
Requirements, Constraints & Risks

**Economic**
- Very high levels of capital
- Ongoing operational funding (e.g., power, maintenance, operations)
- Investors and a suitable business enabled environment
- Insufficient capital and operating funding
- Shipping cost volatility and relatively small scale on global stage

**Market**
- Stable and reliable market
- Commodity fluctuations
- Venture is not economic

**Shipping**
- Stable shipping routes and costs for both in-country (where relevant) and to markets outside the Pacific
- Shipping routes fluctuate and costs increase
- Unable to ship to market economically

**Technical**
- High level of technical capability
- Pacific countries are smaller, imported expertise would be required
- Technical capability cannot be achieved
- Insufficient maintenance due to lack of funding and/or lack of technical capability
### Requirements, Constraints & Risks (cont.)

<table>
<thead>
<tr>
<th>Environmental</th>
<th>Improved impacts on the environment through reduction in high impact disposal</th>
<th>Clean technologies required to ensure harmful wastes and emissions are not produced</th>
<th>That one set of environmental impacts from waste are transferred to polluting industry practices</th>
<th>Mismanagement of residuals (hazardous waste) Poorly managed air emissions (Lead processing)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Political</td>
<td>The hubs need to be resilient to potential political instability</td>
<td>Governments of hub nations should have strong political will to support recycling</td>
<td>The success of the network is impacted by the hub nation's level of political will for recycling</td>
<td></td>
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<tr>
<td>Legislative</td>
<td>All necessary MEAs need to be concluded</td>
<td>The regional hub nation has not concluded all five MEAs and does not have specific implementing legislation for the MEAs that they have concluded</td>
<td>The MEA status across the five national hubs is varied</td>
<td>The processing and export of certain recyclable streams may be impacted</td>
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<tr>
<td>Social</td>
<td>The hubs need to service the regional community</td>
<td>The regional hub will target 100 percent of urban and 50 percent of rural populations</td>
<td>The population size that each individual national hub needs to service varies significantly</td>
<td>Very small or very large national hubs may struggle to manage all the recyclable waste domestically generated</td>
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</tbody>
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Preliminary Roadmap

Stage 1: Feasibility Study Completed, Funding and Operators Identified

Stage 2: Recycling Hub Operating Model Established

Stage 3: Improved Collection, Compaction and Shipping of Target Recyclables Completed

Stage 4: Value added technologies are expanded and/or established

Stage 5: Pacific Recyclables converted to value added products

Stewart Williams | Project Team Leader
Benefits to the Private Sector

Offers Business Case opportunities in Recycling through:

- Full analysis of the recycling value chain
- Mapping logistical pathways (shipping & hubs)
- Mapping current recycling business cases, barriers and subsidies
- Identifies technology improvements/potential value adding opportunities
- Conducting financial (CAPEX/OPEX) and economic analysis (jobs created, GHG avoided, impacts)
- Identifies existing and emerging markets
- Identifying potential investment (donor/private sector funding sources)
- Creating a regional recycling hub to improve Pacific recycling metrics (higher volume/higher value)
Benefits to the Private Sector

• Uplifting Existing Recyclers:
  • Improved collection, compaction, export and market identification for aluminium, scrap steel, paper and cardboard, PET plastic and film for countries exported internationally or supplying the Pacific Regional Recycling hub
  • Requires system and equipment upgrades for most Pacific Island countries, improvements by governments in the business enables environment, private sector to improve value chains and logistics
  • Requires virtual support to provide information and co-ordination between and within the recycling network (mechanisms to be identified in the draft report being developed)

• Creating or Expanding New Value Added Recycling
  • For the Fiji Hub and PNG it has been identified that expanding on existing value added processes for ULAB and paper is feasible while new value added technologies are viable for aluminium, cardboard, PET plastic and plastic film
  • Requires system and equipment upgrades for targeted and/or new recyclers in Fiji and PNG and identification of appropriate technologies for aluminium, cardboard, PET plastic and plastic film
  • Deeper engagement with recyclers and on technologies is progressing in the current phase
Collaborative Partners

- Development partners ADB, World Bank, JICA, EU, DFAT, MFAT, UN
- Regional organisations and programmes such as SPREP, J-PRISM
- Associations such as ANZPAC Plastic Pact, National (PICs) waste and recycling associations, VESS
- 14 Pacific Island Governments
- Private sector actors such as: South Pacific Waste Recyclers, Recycle Corp, SolPower, Pacific Batteries
- Various technology providers
Pacific Recycler Inputs to the Study

• For Existing and/or Aspiring Recyclers interested in:
  • Uplifting existing operations
  • Expanding on current value added processes (creating products from waste streams)
  • Creating new value added processes

• Please contact the PRIF TA Team using the following details:

  TA Team Leader - Stewart Williams
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Thank You!

Contact Information

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