

FINANCIAL FRAMEWORK

Integrated Solid Waste Management System in Sint Maarten (2021)



Overview

This financial framework sets out how Sint Maarten can move from a heavily subsidized, fragmented solid waste model to a financially self-sustaining Integrated Solid Waste Management System (ISWMS). It translates technical options for modernizing the waste chain—collection and transport, recycling and recovery (MRF/organics), engineered disposal (sanitary landfill), and possible waste-to-energy (WTE)—into a coherent financing and revenue strategy that can pay for lifecycle costs while advancing environmental, health, and resilience goals.

The framework addresses:

- Baseline costs and gaps across the current system;
- Future system scenarios with indicative CAPEX/OPEX and internal revenue potential;
- Tariff and fee instruments (direct user charges, gate/tipping fees, surcharges, producer responsibility);
- Billing and collection mechanisms, ring-fencing, and governance arrangements;
- Affordability and social protection considerations;
- Outsourcing/PPP options and risk allocation;
- An implementation roadmap to phase in reforms and revenues.

Sint Maarten is a tourism-intensive, high-income small island economy with one of the Caribbean's highest per capita waste generation rates. The Pond Island municipal landfill is unlined, lacks leachate/gas

management, and regularly experiences fires and slope instability; its remaining life is short even under improved operations. Household collection is contracted by government; commercial collection is largely unregulated and open-subscription, and tipping fees are not charged. There is no comprehensive solid waste law and no empowered waste authority; VROMI combines operational and oversight functions. Data are weak without a functional weighbridge and standardized reporting. The result is a system that is environmentally risky, operationally fragile, and fiscally unsustainable.

Objectives and Audiences

The frameworks define a practical, equitable, and enforceable financing architecture for Sint Maarten's ISWMS that (i) recovers full lifecycle costs over time; (ii) aligns incentives with the waste hierarchy (reduce, reuse, recycle, recover, dispose); (iii) protects low-income households and maintains social license; and (iv) supports robust governance, transparent financial management, and credible private sector participation.

The specific objectives are:

- Establish a waste fee framework comprising direct user tariffs and disposal gate fees, complemented by targeted surcharges and producer responsibility instruments.
- Determine billing, collection, and enforcement mechanisms with high payment performance (e.g., bundling charges with electricity bills).
- Create a ring-fenced Solid Waste Fund under a new Integrated Solid Waste Management Authority (ISWMA) to receive and manage all SWM revenues transparently.
- Calibrate tariff trajectories to phased infrastructure roll-out, verified waste flows, and visible service improvements.
- Provide affordability analysis and design social safeguards (progressive charging, targeted support).
- Define outsourcing/PPP pathways (service contracts, concessions/DBO/DBOT/DBFM) and risk allocation.

The framework targets a defined set of audiences: the Government of Sint Maarten, with VROMI responsible for policy, sector oversight, and procurement; the Ministry of Finance overseeing tariff policy, billing integration with utilities, and ring-fencing and treasury arrangements; the Office of the Prime Minister providing inter-ministerial coordination and legislative direction; and the National Recovery Program Bureau (NRPB) aligning investment financing with the overall financial framework. It also addresses the World Bank and the Government of the Netherlands as financing and safeguards partners; utilities and regulators, including GEBE; private sector actors such as waste collection contractors, recyclers, logistics firms, and prospective investors; and civil society and the public, whose participation, tariff compliance, and local oversight support will underpin social acceptance and sustained performance.

Findings and Recommendations

Baseline costs and current financing

- The current system's OPEX is estimated at about US\$78 per tonne, high relative to service quality, reflecting inefficiencies and diseconomies of scale. In a recent reference year, roughly 68% of spending went to collection and 32% to disposal.
- There are no direct, regulated waste revenues. Households pay no waste fee; commercial haulers face no gate fee; tourism-related levies are not earmarked for SWM.
- Without a weighbridge and standardized reporting, mass balance and unit cost monitoring are unreliable, undermining tariff setting and accountability.

The framework evaluates multiple future configurations

- Scenario 1: No-project baseline—continues high deficits per tonne and escalating liabilities.
- Scenario 2: New sanitary landfill and C&D facility (no integrated recovery facility)—lowest apparent cash deficit per tonne but limited sustainability/environmental gains.
- Scenario 3: ISWMF with a Material Recovery Facility (MRF) and organics processing (no WTE)—improves diversion and internal revenues from recyclables; still requires cost-recovery tariffs.
- Scenario 4: ISWMF with MRF/organics plus WTE—highest diversion/lowest long-term landfill demand, but highest capital and operating cost; internal energy revenue offsets some costs but not all. Preference: Scenarios 3 and 4 score best on long-term sustainability and land-use efficiency; Scenario 2 has lower near-term financing needs but locks in higher landfill reliance. In all cases, a structured fee system is required.

Revenue instruments and tariff structure Direct charges (core)

- Household and institutional user fee: Introduce a recurring waste charge for all premises, with a progressive structure. Recommended collection mechanism: bundle with the monthly electricity bill from GEBE, leveraging high coverage and payment performance. Variable billing tied to electricity consumption (as a proxy for income and waste generation) supports progressivity and cross-subsidy.
- Commercial tariffs: Regulate commercial collection and apply tariffs commensurate with volume/weight. Require registration and reporting by haulers; enforce flow control directing waste to authorized facilities.
- Gate/tipping fees:
 - Landfill gate fee: Indicative benchmark around US\$35–36 per tonne for engineered landfill O&M.
 - ISWMF gate fee: Medium-term indicative fee on the order of US\$59 per tonne (no WTE) to about US\$99 per tonne (with WTE), subject to final design, throughput, and internal revenues.
 - Integrated collection tariff: Illustrative blended collection tariff around the high US\$80s per tonne (e.g., ≈US\$87.5/t) to cover collection/transport and the facility gate fee.

Indirect charges (complements)

- 2–3% add-on to business/property tax to fund street sweeping and public space cleanliness.
- Import surcharge on cement (e.g., US\$0.50–1.00 per bag) and/or per tonne C&D gate fees to fund C&D processing and disposal.
- Do a packaging “throwaway” charge as a small fee (per plastic/glass beverage container to support collection and recycling; potentially paired with a deposit refund scheme for higher return rates.
- Enforce MARPOL and levy appropriate handling/tipping fees for ship-generated waste and cruise calls.

Producer responsibility and incentives

- Gradually implement EPR for priority streams (tires, batteries, ewaste) to finance end of life management.
- Consider a deposit system to significantly increase return rates for bottles/cans and reduce litter.
- Enact differential tariffs and compliance requirements (e.g., lower fees with source separation contracts for large generators).

Billing, collection, and enforcement

- Electricity bill bundling to capture near-universal coverage and promote payment discipline. Alternatives (water bill, municipal billing) may be considered but usually have lower performance.
- Non-payment protocols aligned with utility practices; for commercial entities, permit and license linkage; for haulers, gate access and franchise/permit sanctions.
- All billing systems linked to the waste information system for reconciliation of tonnages, invoices, and payments.

Governance, ring-fencing, and institutional arrangements

- Establish the Integrated Solid Waste Management Authority (ISWMA) to plan, procure, regulate, and oversee services; set tariffs (within a regulatory framework); manage the Solid Waste Fund; publish financials and performance dashboards.
- Set up a Solid Waste Fund (ring-fenced) for all SWM revenues (fees, surcharges, EPR transfers) and expenditures (O&M, capital replacement), governed by clear rules and audited annually.
- Contracts and PPPs:
 - Service contracts for household collection and street cleaning (performance-based).
 - Models for MRF/organics, sanitary landfill, and optional WTE—allocating design, construction, O&M, and revenue risks to capable private partners with robust KPIs.
 - Franchising for C&D collection/processing with service territories and quality/price regulation.

Affordability and social protection

- Progressive charging: Link household fees to electricity consumption bands to achieve cross-subsidization—lower-income households pay lower fees.
- Phased ramp-up: Introduce fees gradually, synchronized with visible service improvements (cleaner streets, fewer fires, better collection regularity).
- Targeted support: Consider discounts/waivers for vulnerable groups funded from the Solid Waste Fund or social budgets; cap total waste charges as a share of household income for the lowest quintiles.
- Communication: Transparent messaging on why fees are needed, what they fund, and how performance is improving, to build trust and compliance.

Operational controls and data

- Weighbridge and reporting: Recommission/ install weighbridge(s) at disposal/ISWMF; require all haulers to report tonnages, routes, and segregated loads; audit data regularly.
- Flow control: Direct all MSW to authorized facilities via ordinance and permit conditions; enforce against unauthorized dumping.
- Performance management: Publish regular indicators (diversion rates, fires, leachate control, collection service levels, financial outturns) to support accountability and tariff reviews.

Lessons Learned

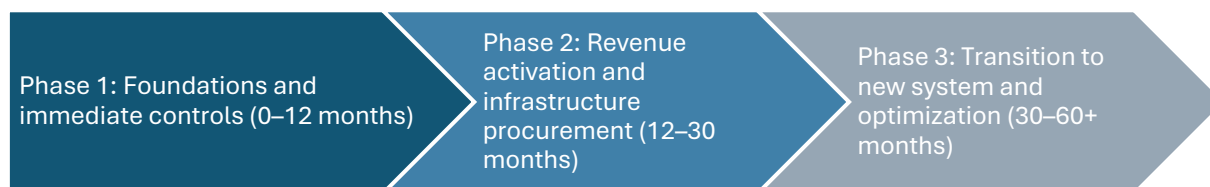
Lessons learned show that service credibility must come first, as users will pay when they see improvements, requiring fees to be sequenced with quick wins—landfill fire control, cleaner streets, reliable collection—and clear communication. A strong collection channel is essential, since bundling waste fees with utility bills is globally proven to improve collection rates and reduce arrears. Price signals also matter, with tipping fees and regulated tariffs reducing perverse incentives, such as uncontrolled dumping and supporting diversion when combined with separation mandates and MRF capacity. Ring-fencing is non-negotiable because dedicated

funds and transparent accounting build trust and ensure SWM dollars are spent on SWM. Small-island economics require careful right sizing, as export-oriented recycling depends on quality through MRFs and clean feedstock, shipping costs, and stabilizing mechanisms. Integrating the informal sector by formalizing and registering recyclers and creating inclusion pathways preserves livelihoods and raises material quality.

Key Risks and Mitigations

- **Political and institutional risk:** Delays in establishing the ISWMA or passing enabling legislation stall reforms. Mitigate with cross-party agreements, early legal milestones, and stage-gated capital decisions tied to governance readiness.
- **Financial risk:** Insufficient revenue collection and enforcement; affordability concerns reduce compliance. Mitigate by bundling with utility billing, progressive tariffs, phased ramp-up, and targeted social protection; maintain a compliance/enforcement regime.
- **Social acceptance risk:** Resistance to new fees or facility siting. Mitigate through transparent engagement, visible service gains before/with fees, and community benefits near facilities.
- **Market risk:** Commodity price/shipping volatility reduces recycling revenues. Mitigate by focusing on quality, diversifying materials, leveraging EPR/deposit refund, and exploring regional consolidation partnerships.
- **Technical and climate risk:** Hurricanes, fires, or infrastructure failures disrupt service. Mitigate with climate-resilient designs, redundancy (transfer/disposal), robust landfill gas/leachate controls, and codified emergency debris protocols.
- **Data and control risk:** Weak data compromise tariff setting and trust. Mitigate by mandating weighbridge use, standard reporting, independent audits, and public dashboards.

Implementation Roadmap and Next Steps



Phase 1: Foundations and immediate controls (0–12 months)

- Legal and institutional:
 - Draft and enact a comprehensive solid waste law enabling flow control, permitting, data/reporting, tariffs, and enforcement.
 - Establish the ISWMA; approve statutes for the Solid Waste Fund and ring-fencing; define tariff setting procedures and regulatory oversight.
- Finance design:
 - Approve the waste fee framework (household, commercial, gate fees); design progressive tariffs and collection via GEBE billing; define non-payment sanctions and complaint resolution.
 - Identify and adopt indirect charges (area cleaning surcharge; cement bag surcharge; container throwaway fee; maritime waste fees); prepare EPR/deposit refund roadmap.
- Data and controls: Recommission/install weighbridge(s); standardize reporting templates; register haulers; institute flow control; pilot a simple waste information system.
- Operational quick wins: Execute landfill stabilization (compaction, daily/intermediate cover, stormwater controls, fire suppression, slope stabilization). Launch high-yield diversion pilots (commercial cardboard; green waste mulching).

- Communications: Publicly announce the fee roadmap, protections for low income users, and the service improvement plan; publish baseline performance metrics.

Phase 2: Revenue activation and infrastructure procurement (12–30 months)

- Revenue collection: Initiate phased household and commercial billing via electricity bills; start landfill/ISWMF gate fees; set up reconciliation between weighbridge and billing data.
- PPP and contracts: Tender performance-based service contracts for collection and street cleaning; procure concessions/DBO/DBOT for the MRF/organics facility, sanitary landfill, and (if greenlit later) WTE. Establish franchise zones and standards for C&D collection/processing.
- Policy instruments: Enact EPR for priority streams; consider deposit refund for beverages; implement area cleaning surcharge and throwaway charge.
- Monitoring: Launch public performance dashboards (service levels, diversion rates, fires, finances); commission independent audits.

Phase 3: Transition to new system and optimization (30–60+ months)

- Commissioning: Bring the sanitary landfill (with leachate/gas systems) and MRF/organics online; begin controlled closure/remediation of the legacy landfill.
- Scaling: Roll out island-wide source separation mandates by generator type; formalize recycler registration and quality standards.
- Decision gate: Make a go/no-go decision on WTE based on verified mass balance, economics, and safeguards; if approved, proceed to construction and integration.
- Financial sustainability: Adjust tariffs and gate fees periodically based on audited costs and performance; maintain ring-fenced funds for O&M and capital replacement; keep social protections targeted and effective.
- Institutionalization: Regular independent financial and performance audits; five-year strategy reviews; continuous capacity building for ISWMA and operators.

Methodology

- **Data and document review:** Consolidated administrative records on SWM costs and operations; prior waste characterization and landfill assessments; national demographic/economic statistics. Historical weighbridge records (where available) were triangulated with operator logs and field estimates to approximate tonnages and unit costs.
- **Scenario development and financial modeling:** Constructed multiple future system configurations; estimated order of magnitude CAPEX and OPEX; modeled indicative gate fees and user tariffs; and assessed internal revenues (recyclables, potential energy offtake).
- **Tariff design and affordability analysis:** Applied full cost accounting principles to allocate costs across functions; developed progressive tariff options; tested household affordability using electricity consumption as a proxy for income and waste generation.
- **Institutional and PSP options analysis:** Assessed alternative billing/collection channels; designed ring-fencing arrangements; evaluated contract structures (service, concession/DBO/DBOT/DBFM, franchise) and risk allocation.
- **Stakeholder consultations:** Engaged VROMI, finance authorities, utility representatives, private haulers/recyclers, and development partners to validate assumptions, assess billing practicality (e.g., electricity bundling), and refine instruments (EPR, surcharges).

This summary was produced with the assistance of an AI language model based on the original report. The full report is available at sintmaartenrecovery.org/analytical-studies