

Pathways to Achieve 50% Waste Diversion in the Commonwealth of the Northern Mariana Islands by 2030

By K-Andrea Evarose S. Limol
Environmental Sciences Graduate Program, Oregon State University
Fall 2025

EXECUTIVE SUMMARY

Introduction

The Commonwealth of the Northern Mariana Islands (CNMI) faces growing challenges in managing solid waste, due to limited land, aging infrastructure, and reliance on landfills. To address these challenges, the CNMI has committed – through its inaugural Comprehensive Integrated Solid Waste Management Plan (CISWMP) – to divert 50% of waste from landfilling by 2030.

Figure 1. Map of the CNMI



Source: CIA World Factbook, n.d.

Materials & Methods

This study examines how the CNMI can realistically meet its waste diversion goal, using existing data, current infrastructure, and lessons learned from other island and remote communities facing similar challenges, namely Guam, Kaua’i County in Hawai’i, and the Kenai Peninsula Borough in Alaska.

Results

The CNMI currently has only one fully permitted landfill, located on Saipan. Tinian and Rota rely on open dump sites that are planned for future upgrades. Recycling and composting options are limited, and many materials must be shipped off-island for processing. Illegal dumping remains a concern, and waste data collection is inconsistent across islands.

Waste data from Saipan, Tinian, and Rota show that most of the waste generated in the CNMI falls into three main categories:

- Organic waste, such as food scraps and yard waste;
- Paper and cardboard, especially shipping boxes; and
- Plastic materials, particularly plastic bags and film.

Together, these materials make up more than half of all waste disposed across the CNMI. This means that focusing on these materials offers the greatest opportunity to reduce the amount of waste sent to landfills.

Table 1 Overall Characterization Results for Saipan

Group	Category	Average – Saipan	Error +/- (90%)
Fiber	Old Corrugated Cardboard	22.0%	±6.1%
	Other Fiber Materials	11.8%	±2.8%
Plastic	PET (#1)	3.8%	±1.0%
	HDPE (#2)	1.3%	±0.6%
	Mixed Plastics	4.3%	±0.9%
	Bags and Film	8.6%	±1.2%
Glass	Glass and Ceramics	3.9%	±1.5%
Metals	Ferrous Metals	2.7%	±0.9%
	Non-Ferrous Metals	2.1%	±0.6%
Organics	Yard Waste	2.2%	±1.2%
	Other Organics	13.4%	±3.0%
Other	C&D	7.1%	±5.1%
	Textiles, Leather, & Rubber	6.0%	±1.4%
	Dirt and Other Fines	5.2%	±1.2%
	Other Bulky or Composite Items	5.8%	±3.9%

Source: CNMI Comprehensive Integrated Solid Waste Management Plan

Table 2 Overall Characterization Results for Tinian

Group	Category	Average – Tinian	Error +/- (90%)
Fiber	Old Corrugated Cardboard	10.5%	±3.3%
	Other Fiber Materials	16.3%	±1.7%
Plastic	PET (#1)	6.1%	±1.4%
	HDPE (#2)	2.5%	±0.6%
	Mixed Plastics	4.6%	±1.4%
	Bags and Film	11.3%	±0.8%

Glass	Glass and Ceramics	6.3%	±1.5%
Metals	Ferrous Metals	5.4%	±1.0%
	Non-Ferrous Metals	3.9%	±0.7%
Organics	Yard Waste	2.3%	±1.0%
	Other Organics	12.5%	±2.1%
Other	C&D	2.7%	±1.5%
	Textiles, Leather, & Rubber	8.6%	±1.9%
	Dirt and Other Fines	3.6%	±0.7%
	Other Bulky or Composite Items	3.5%	±1.1%

Source: CNMI Comprehensive Integrated Solid Waste Management Plan

Table 3 Overall Characterization Results for Rota

Group	Category	Average – Rota	Error +/- (90%)
Fiber	Old Corrugated Cardboard	11.8%	±4.2%
	Other Fiber Materials	7.9%	±6.1%
Plastic	PET (#1)	4.3%	±1.1%
	HDPE (#2)	1.9%	±1.6%
	Mixed Plastics	3.8%	±2.7%
	Bags and Film	8.8%	±4.7%
Glass	Glass and Ceramics	5.2%	±7.8%
Metals	Ferrous Metals	5.8%	±1.8%
	Non-Ferrous Metals	5.0%	±2.6%
Organics	Yard Waste	0.4%	±0.6%
	Other Organics	11.8%	±8.1%
Other	C&D	1.0%	±0.9%
	Textiles, Leather, & Rubber	20.4%	±19.0%
	Dirt and Other Fines	0.8%	±1.1%
	Other Bulky or Composite Items	11.1%	±14.2%

Source: CNMI Comprehensive Integrated Solid Waste Management Plan

Other similar island and remote communities – such as Guam, Kaua’i County in Hawai’i, and the Kenai Peninsula Borough in Alaska – have successfully increased waste diversion by:

- Reducing food and yard waste through composting;
- Improving recycling of cardboard and paper;
- Using policies and education to reduce plastic waste;
- Strengthening enforcement while making proper disposal easier; and
- Investing in public education and community involvement.

These communities show that long-term success comes from coordinated systems, not one-time programs.

Discussion, Summary, and Conclusions

The study concludes that the CNMI can reach its 2030 waste diversion goal by:

- Prioritizing organic waste, paper, and plastics;
- Expanding composting and recycling efforts;
- Improving waste tracking and enforcement;
- Supporting public education and community participation; and
- Coordinating efforts across agencies and islands.

Reaching 50% waste diversion by 2030 is achievable for the CNMI. By focusing on the largest waste streams and applying proven approaches from similar communities, the CNMI can reduce landfill use, protect the environment, and build a more sustainable waste management system for future generations.

Table 4. Waste Diversion and Reduction Strategies

Waste Type	Strategy	Guam	Kaua'i County	Kenai Peninsula Borough	CNMI (Proposed)
Fiber (OCC, mixed paper)	Drop-off recycling centers	Multiple drop-off centers for businesses & residents	Multiple drop-off centers, curbside programs	Drop-off centers, curbside collection, private haulers	Set up drop-off centers & curbside programs; interagency collaboration; tracking systems
	Curbside recycling programs	Curbside programs for residents	Curbside collection (in select areas)	Curbside collection (in select areas)	Implement curbside programs, work with haulers for fiber recycling
	Mandatory recycling ordinances	Mandated for businesses & high-volume materials	Mandatory for certain materials	Limited mandates	Pass mandatory recycling ordinances for fiber materials
	Incentives for source segregation	Incentives for businesses	Incentives & voluntary programs for businesses	Incentives for businesses to recycle	Offer incentives for businesses to separate waste
	Educational campaigns and public outreach	Public education on the harms of fiber waste	Educational programs on fiber waste reduction	Education on proper fiber sorting & recycling	Launch public education campaigns on fiber waste reduction
Organics (green waste, food waste)	Community composting programs	Food waste composting initiatives	Pilot programs for home and community composting	Drop-off centers for green waste, community composting	Set up community composting programs & educational outreach
	Curbside green waste collection	Curbside collection for green waste	Curbside green waste collection (in select areas)	Curbside collection & drop-off for green waste	Expand curbside collection & drop-off centers for green waste
	Food waste diversion and education	Public education and composting workshops	Voluntary programs for businesses to segregate food waste	Education programs on composting, waste diversion	Launch food waste diversion programs & offer education
	Green waste diversion through processing (mulch, compost)	Green waste processed into mulch & compost	Green waste processed into mulch & compost	Green waste processed into mulch, home composting	Process green waste locally into mulch & compost, reduce landfill use
	Educational campaigns and public outreach	Public education on the benefits of organics processing	Educational programs on organic waste reduction	Education on proper organic waste sorting, composting, & mulching	Launch public education campaigns on organic waste reduction
Plastics	Plastic bag bans and restrictions	Plastic bag bans, restrictions on single-use plastics	Plastic bag bans, restrictions on straws, Styrofoam	No plastic bag ban, but recycling	Implement plastic bag bans,

				programs for plastics	restrictions on single-use plastic
	Plastic recycling programs	Drop-off centers for plastic recycling	Curbside collection & drop-off centers for plastics	Drop-off centers, public education on recycling plastics	Set up drop-off centers & curbside collection for plastics
	Educational campaigns and public outreach	Public education on the harms of plastic waste	Educational programs on plastic reduction	Education on proper plastic sorting & recycling	Launch public education campaigns on plastic reduction
	Incentives for plastic waste reduction	Incentives for businesses to reduce plastic packaging	Incentives for businesses to reduce plastic use	Voluntary programs for businesses to reduce plastic use	Provide incentives to businesses to adopt sustainable packaging

References

An Act to Approve and Amend the Integrated Solid Waste Management Plan, Guam Public Law No. 25-175 (2000). https://archives.guamlegislature.gov/Public%20Laws/Public_Laws_25th/P.L._%2025-175.pdf

CIA World Factbook. (n.d.). *Northern Mariana Islands map showing the major islands of this archipelago in the North Pacific Ocean* [Photograph]. <https://www.cia.gov/the-world-factbook/countries/northern-mariana-islands/map/>

CNMI Office of Planning and Development. (2025). *Comprehensive Integrated Solid Waste Management Plan for the Commonwealth of the Northern Mariana Islands*. CNMI Office of the Governor. <http://www.opd.gov.mp/assets/revised-draft-ciswmp-mar2025.pdf>

County of Kaua'i Department of Public Works Solid Waste Division. (2021). *Integrated Solid Waste Management Plan Update*. State of Hawaii. https://www.kauai.gov/files/assets/public/v/1/public-works/documents/proof-v2_kauaico_iswmp_update_draft5_final-211103.pdf

Guam Environmental Protection Agency. (2006). *Guam 2006 Integrated Solid Waste Management Plan*. https://library.sprep.org/sites/default/files/Guam_Strategy_2006.pdf

Guam Environmental Protection Agency. (2023). *Integrated Solid Waste Management Plan*. https://epa.guam.gov/wp-content/uploads/2023/09/Integrated-Solid-Waste-Management-Program_Jan2023.pdf

Guam Environmental Protection Agency. (2023). *Zero Waste Master Plan*. https://epa.guam.gov/wp-content/uploads/2023/09/GUAM_ZWMP2023.pdf

Guidelines for Development and Implementation of State Solid Waste Management Plans, 40 CFR § 256 (2017). <https://www.ecfr.gov/current/title-40/chapter-I/subchapter-I/part-256>

Hawai'i Revised Statutes, Title 19, Chapter 342G (1991). https://capitolwebsite.azurewebsites.net/hrsarchive/hrs2006/Vol06_Ch0321-0344/HRS0342G/HRS_0342G-.HTM

- Hawai'i State Legislature. (1991). *Chapter 342G: Integrated Solid Waste Management*. State of Hawai'i. https://data.capitol.hawaii.gov/sessions/session2017/HRS-Chapter-PDFs/HRS_0342G.pdf
- Kenai Peninsula Borough. (2019). *2019 Kenai Peninsula Borough Comprehensive Plan*. State of Alaska. https://www.kenaifishpartnership.org/wp-content/uploads/2021/10/2019_KPB_Comprehensive_Plan.pdf
- Kenai Peninsula Borough. (2025). *Solid Waste*. State of Alaska. <https://www.kpb.us/community-services/roads-landfill/solid-waste/solid-waste-overview>
- Office of Solid Waste Management. (2000). *Hawai'i 2000 Plan for Integrated Solid Waste Management*. State of Hawai'i Department of Health. <https://health.hawaii.gov/shwb/files/2013/06/swmgmpln1.pdf>
- Office of Solid Waste Management. (2010). *Report to the Twenty-Fifth Legislature State of Hawai'i 2010*. State of Hawai'i Department of Health. https://health.hawaii.gov/shwb/files/2013/06/2010_OSWM_Annual_Report.pdf
- Office of Solid Waste Management. (2024). *Office of Solid Waste Management Annual Report to the Thirty-Second Legislature State of Hawai'i 2025*. State of Hawai'i Department of Health. <https://health.hawaii.gov/opppd/files/2025/09/2025-OSWM-LEGISLATIVE-REPORT.pdf>
- United Nations. (n.d.). *Goal 12 Ensure sustainable consumption and production patterns*. <https://www.un.org/sustainabledevelopment/sustainable-consumption-production/>
- US Census Bureau. (2020). *2020 Census Population of the Commonwealth of the Northern Mariana Islands: Municipality and Village*. United States Department of Commerce. <https://www2.census.gov/programs-surveys/decennial/2020/data/island-areas/commonwealth-of-the-northern-mariana-islands/population-and-housing-unit-counts/commonwealth-northern-mariana-islands-phc-table02.pdf>
- US Census Bureau. (2021, August 25). Alaska, Least Densely Populated State, Had Population of 733,391 in 2020. *US Department of Commerce*. <https://www.census.gov/library/stories/state-by-state/alaska.html>
- US Census Bureau. (2021, August 25). Hawaii Added More Than 94,000 People Since 2010. *US Department of Commerce*. <https://www.census.gov/library/stories/state-by-state/hawaii.html>
- US Environmental Protection Agency. (2025, August 20). *Sustainable Materials Management: Non-Hazardous Materials and Waste Management Hierarchy*. <https://www.epa.gov/smm/sustainable-materials-management-non-hazardous-materials-and-waste-management->

