



**GUAM SOLID WASTE AUTHORITY
BOARD OF DIRECTORS MEETING
AGENDA**

**THURSDAY, MARCH 19, 2026
VIA VIDEO CONFERENCE**

- I. CALL TO ORDER
- II. ROLL CALL
- III. DETERMINATION OF PROOF OF PUBLICATION
- IV. APPROVAL OF AGENDA ITEMS
- V. APPROVAL OF MINUTES
- VI. REPORTS
 - A. RECEIVER REPORTS
 - i. RECEIVERSHIP UPDATE
 - ii. TRANSITION PLAN UPDATE
 - B. MANAGEMENT REPORTS
 - i. OPERATIONAL UPDATE
 - C. LEGAL COUNSEL'S REPORT
 - D. COMMITTEE REPORTS
- VII. UNFINISHED BUSINESS
 - A. ISLAND WIDE TRASH COLLECTION INITIATIVE
 - B. LAYON CELLS 1 AND 2 CLOSURE
 - C. SUCCESSION PLANNING
- VIII. NEW BUSINESS
- IX. EXECUTIVE SESSION
- X. COMMUNICATIONS AND CORRESPONDENCE
- XI. PUBLIC FORUM
- XII. NEXT MEETING
- XIII. ADJOURN

**Guam Solid Waste Authority Board of Directors Meeting
Thursday, March 19, 2026 – 1:00 PM (ChST)
Join Zoom Meeting**

Link: <https://zoom.us/j/9140408814?pwd=TjZ3U0dHSVd0ajlKRjBhcWFrc1ZYZz09>

Meeting ID: 914 040 8814

Passcode: 777546

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Access live stream of the meeting on GSWA website: <https://www.gswa.guam.gov/>

*For more information, please contact GSWA Admin at admin@gswa.guam.gov or 671-646-3215.
Persons needing telecommunication device for the Hearing/Speech Impaired (TDD) may contact 671-646-3111. This advertisement was paid for by GSWA.*

Bangs topples Duenas for March senior bowling title

Pacific Daily News

Top seed Sheila Bangs climbed to the top of the mountain at Central Lanes last Sunday, holding off a hard-hitting Mike Duenas, 251-235, with handicap to claim the 2026 PinPoint Senior Monthly Challenge for March, according to the Guam Bowling Congress.

The tournament began with senior newcomer John Raymundo taking \$106 in the Last Man Standing pot competition. Raymundo played it safe and stopped after rolling for 15% of the \$710 pot.

The balance will now

move to next month's tournament, with the pot growing with more participants coming to take a shot at this lucrative pot game.

Opening elimination rounds in Bracket A and B for 12 of the top 16 bowlers ended with 7th seed Virgil Toledo and 5th seed Edgar Nalundasan advancing over 16th seed John Raymundo, 14th seed Leody Ersando, 12th seed John Platz, and 9th seed Zaldy Ponce in Bracket A.

The bracket B competition had 11th-seeded Gina San Nicolas and 10th-seeded Rick Torres advance past 15th-seeded Henry Abasta, 13th-seeded Jesse Eyoel, 8th-seeded John Tenorio, and 9th-seeded Chief Qui-

tugua.

In the A bracket quarterfinals, Toledo and 3rd seed Jim Pinaula fell to Nalundasan to head into the next round.

The B bracket also saw an upset, with Torres and 4th-seeded Jude Tenorio having their title hopes dashed by San Nicolas, who advanced.

With the final four semifinals in place, where it is a race to two victories to make the finals, the outcomes proved very interesting as it was an all-lady matchup with San Nicolas in the way of Bangs' title quest.

The other semi-final contest was an all-male battle between Duenas and Nalundasan. Duenas swept Nalundasan with two straight victories.

In a much tighter contest, Bangs had to beat San Nicolas in a roll-off after the two had a victory apiece in their semi-final match

in order to go for the title.

The final was a seesaw battle with both Bangs and Duenas using their unique bowling styles to try and master the championship pair for the crown.

It was the hard rolling power ball of Duenas that took the early lead against the steady rolling Bangs, who roared back, marking steadily to stay with Duenas.

But an open frame by Duenas in the latter frames was what Bangs took advantage of, and despite Duenas' three strikes in the 10th frame, it was not enough to overcome Bangs, who played clean until the end but had enough with her score and handicap to take the championship.

Current qualification rounds are underway this month for the April Senior Monthly Challenge and the Last Man Standing competition.

New qualifying rules have made it a much fairer platform for senior bowlers of all skill levels, as this month's results have shown, the Guam Bowling Congress said.

For more information on how to enter the PinPoint SMC, contact Joey Miranda, Jim Pinaula, or Manny Tagle at PinPoint Pro Shop in Central Lanes.



COURTESY OF GUAM BOWLING CONGRESS
Sheila Bangs is named champion at the 2026 PinPoint Senior Monthly Challenge for March.



COURTESY OF GUAM BOWLING CONGRESS
Mike Duenas wins runner up at the 2026 PinPoint Senior Monthly Challenge for March.

VANESSA WILLIAMS CRUZ, ESQ.
WILLIAMS CRUZ LAW
204 Hessler Place, Suite 203B
Hagåtña, Guam 96910
Phone: 671-922-5689/888-477-5657
Email: SERVICE@WILLIAMSCRUZ.LAW
Attorney for Petitioner
Joseph J.Q. Sablan

IN THE SUPERIOR COURT OF GUAM

IN THE MATTER OF THE ESTATES

OF

JOSE M. SABLAN and FLORENCE Q. SABLAN,

Deceased.

PROBATE CASE NO. PR0055-23

NOTICE OF FIRST AMENDED FINAL REPORT OF ADMINISTRATOR AND PETITION FOR ALLOWANCE OF ATTORNEY'S FEES AND FINAL DISTRIBUTION

NOTICE IS HEREBY GIVEN that Petitioner JOSEPH J.Q. SABLAN, Administrator of the Estates of Jose M. Sablan and Florence Q. Sablan, deceased, has filed the FIRST AMENDED FINAL REPORT OF ADMINISTRATOR AND PETITION FOR ALLOWANCE OF ATTORNEY'S FEES AND FINAL DISTRIBUTION, in said Court, and that on March 24, 2026 at 11:00 A.M. at the Superior Court of Guam, Hagåtña, Guam, a hearing has been set for the settlement of said account for Final Distribution of said estate. All persons interested in attending said hearing are notified then and there to appear and show cause, if any, why said Petition should not be granted.

Reference is hereby made to the said account and Petition for further particulars.

Dated: February 6, 2026.

ZOOM INFO:
Meeting ID: 752 425 5848
Passcode: JARB

WILLIAMS CRUZ LAW
Attorney for Petitioner

/s/ VANESSA WILLIAMS CRUZ

Frankie T. Perez, Jr., Esq.
424 West O'Brien Drive, Ste. 217
Hagåtña, Guam 96910
ftperezlaw@gmail.com
671-787-8468

Attorney for Administratrix:
NAOMI M. VENTURA

IN THE SUPERIOR COURT OF GUAM

IN THE MATTER OF THE ESTATE

OF

GEORGE WILLIAM TAYLOR,

Decedent,

BY

NAOMI M. VENTURA,

Administratrix.

PROBATE CASE NO. PR0004-26

NOTICE TO CREDITORS

NOTICE IS HEREBY GIVEN by the undersigned, attorney for the Administratrix of the Estate of George William Taylor, deceased, to the creditors of, and all persons having claims against said Estate or against said deceased, that within sixty (60) calendar days after the first publication of the instant Notice, they either file them with the necessary vouchers in the office of the Clerk of the Superior Court of Guam, or exhibit them with necessary vouchers to Attorney Frankie T. Perez, Jr., Suite 217, 424 West O'Brien Drive, Hagåtña, Guam 96910, the same being the place for the transaction of the said Estate.

DATED this 6th day of March 2026.

By: /s/ FRANKIE T. PEREZ, JR., ESQ.

Attorney for Administratrix

GUAM SOLID WASTE AUTHORITY BOARD OF DIRECTORS MEETING
Thursday, March 19, 2026 - 1:00 P.M. (ChST)

Join Zoom Meeting

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Meeting ID: 914 040 8814 | Passcode: 777546

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For more information, please contact GSWA Admin at admin@gswa.guam.gov or 671-646-3215.

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GUAM SOLID WASTE AUTHORITY BOARD OF DIRECTORS MEETING

Thursday, March 19, 2026 - 1:00 P.M. (ChSt)

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GUAM ENVIRONMENTAL PROTECTION AGENCY

AHENSIAN PRUTEKSION LINA'LA GUAHAN

BOARD OF DIRECTORS REGULAR BOARD MEETING: Thursday, March 19, 2026 4:00PM
 Guam EPA Administration Conference Room: 17-3304 Mariner Avenue Tiyan Barrigada, Guam
MEETING LINK: <https://meet.google.com/iqb-nzks-yck>

AGENDA:

I. Call to order	VI. Status Reports
a. Determination of quorum	a. Administrative Appeals
b. Proof of due notice of meeting	1. Tutujan Holdings Guam LLC
II. Approval of Agenda	2. Licensing Decision for Mr. Charles Coffindaffer/Challenge Testing Inc.
III. Approval of meeting minutes: February 19, 2026 Board meeting	b. Notice of Violations
IV. Board Discussion / Action	c. Enforcement
a. Revise Dieldrin IAL Regulations	VII. Public Comments
V. Administrator's Report	VIII. Next Meeting Date and Adjournment

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GUAM SOLID WASTE AUTHORITY
BOARD OF DIRECTORS MEETING MINUTES
THURSDAY FEBRUARY 26, 2026
VIA VIDEO CONFERENCE

I. CALL TO ORDER

Chairman Gayle called the meeting to order for the Guam Solid Waste Authority (GSWA) Board of Directors at 1:04pm.

II. ROLL CALL

Board Members:

Andrew Gayle	Chairman
Margaret Denney	Secretary
James Oehlerking	Member

Management & Staff:

Irvin Slike	General Manager
Kathrine Kakigi	Comptroller
Alma To	Assistant Comptroller
Roman Perez	Solid Waste Management Superintendent
Antoinette Martinez	Administrative Officer

Guests:

Christopher Lund	GBB Federal Receiver Representative
Harvey Gershman	GBB Federal Receiver Representative

III. DETERMINATION OF PROOF OF PUBLICATION

1st Publication with Guam Daily Post, Thursday, February 19, 2026
2nd Publication with Guam Daily Post, Tuesday, February 24, 2026

IV. APPROVAL OF AGENDA ITEMS

Chairman Gayle mentioned the inclusion of the Public Forum, to which GM Slike responded that it was inadvertently left on the agenda. Other than that, Chairman Gayle inquired from the members of the Board if they had any comment or objection, to which there was none.

V. APPROVAL OF MINUTES

Chairman Gayle inquired if the Board members had reviewed the minutes. Secretary Denney responded that she had reviewed them and had no comments. Secretary Denney made the motion to approve the minutes, which was seconded by Member Oehlerking. The motion passed unanimously and the minutes were approved.



VI. REPORTS

a. RECEIVER REPORTS

i. RECEIVERSHIP UPDATE

GBB Federal Receivership Representative Gershman outlined the topics to be discussed in the Receivership Update, which included the District Court Order - Global Mediation, Cessation Certification Status, EPA Additional Work, Ordot Dump Operations and the Ordot Dump Post-Closure funds.

First, Representative Gershman reported on the District Court Order- Global Mediation. He reiterated that the mediation will still take place on March 24 and 25, 2026, and the location updated to Los Angeles, CA. This mediation will cover CV 02-0022, CV 24-00011, and CV-0593-24, and the selected mediator is Mr. Roger Peters. All parties have filed mediation statements and are preparing responses due on March 2, 2026.

Second, Representative Lund spoke about the Cessation Certification and the status of the EPA Additional Work. He reported that the laboratory analysis for the first two sampling events was completed on November 16, 2025 and December 8, 2025. This data was provided to USEPA, GEPA and GSWA and discussed during a technical call on February 12, 2026. The timing for the next scheduled sample events were agreed upon with USEPA during that call to be conducted during the dry season. He shared that the Field Investigation Summary Report was submitted on December 23, 2025, and awaiting comments from USEPA via technical call scheduled for the following day. Chairman Gayle asked for an estimated timeframe for when the Cessation Certification would be filed, and Representative Lund confirmed that the previous estimate of September 2026 is still a valid estimate. Secretary Denney questioned if the sampling can be done early in the dry season to possibly expedite the Cessation Certification process. Representative Lund answered that as discussed with USEPA, they have come up with two rough timeframes, having the last of the sample expected to be taken late May to early June. Member Oehlerking asked if the results yielded positive or negative findings, to which Representative Lund replied that it was discussed in last month's board meeting, but also mentioned the results were generally characterized as looking good, hoping that the next sample events will yield similar results in order to move forward.

Representative Lund moved on to report on Ordot Dump Operations: Leachate Status. He presented a graph indicating the monthly leachate flow from July 2022 to



February 2026, specifically using December 31, 2022 as a marker of when the leaks were fixed. The data indicated that there is a downward trend back to the average daily flow of under 50,000 gallons. For January 2026, 1,144,140 gallons of leachate was produced, averaging 45,500 gallons per day and precipitation was recorded at 7.5 inches for the month. He shared that from January 30, 2026 to February 24, 2026, data indicates an estimated 33,000 gallons of leachate per day and roughly 5.49 inches of precipitation.

Representative Lund discussed Ordot Dump Operations, and reported no changes for routine operations. However, the 5-year topographic Settlement Survey is still ongoing. He reported during the last Board meeting that it would be completed, but its completion was delayed due to other projects. Secretary Denney asked to elaborate what the topographic Settlement Survey entailed. Representative Lund explained that per permit requirements, the Receiver must annually report on settlement on the three monuments on top of the cover. However, every five years, a more detailed topographic survey of the entire cover, to include side slopes, tops, and structures require reporting for comparison to prior surveys. Member Oehlerking asked if there was any result that would prompt them to take action if it shifts more than a certain amount from a measurement standpoint. Representative Lund confirmed that is the case, but also stated that no action has been needed so far. Secretary Denney then asked if at some point the settlement will cease; to which Representative Lund replied that typically 90% of the settlement happens in the first five years. Since Ordot Dump has been around for some time and due to a lot of movement in waste, consolidated waste, and reshaping of the landfill, settlement was likely to still occur. Fortunately, there hasn't been much settlement for several years now. Representative Lund shared that the Annual Surface Emissions Monitoring is done, and reports are in preparation. The maintenance of wellheads is now complete as of February 23rd, and cover maintenance and gas operations are normal. Next, Representative Lund provided an update on the Non-Routine Operations. He reported obtaining the permit for the Soil Vapor Extraction at the end of January, with a start date of February 19, 2026. The extraction project should take no more than 2 weeks to complete. Lastly, he stated the storm swale repair is wrapping up with some contract activity.

Lastly, Representative Gershman reported on the Ordot Dump Post-Closure Funds. For the month of January, approximately \$344,000 in payments were made to Brown & Caldwell Contractors and the Bank of Guam Investment Account Management fee. \$1,133,609.15 in invoices are under review for future payment, with the majority going toward Brown & Caldwell, O&M, additional work charges, and GWA leachate expenses. The post-closure funding currently holds about



\$38,926,019.96 among the three Ordot Dump trust accounts with Bank of Guam. January's total balance is approximately \$257,000 less than December's, as \$343,000 of invoices were recently paid out. Overall, the interest income was greater than the expenses paid in December. A total of \$750,000 was transferred from the receiver's investment account to the checkbook account to cover current and upcoming invoices. Matured CDs were deposited in the Fidelity Money Market Funds so that transferring can be done without penalty. Representative Gershman then shared the current balances of the two accounts that the Receiver uses to pay bills; the TDOA Treasurer contained \$958,392.91 and the Investment account has \$3,581,830.77 totaling \$4,540,223.68 altogether.

b. MANAGEMENT REPORTS

i. OPERATIONAL UPDATE

General Manager Slike started off with sharing that GSWA has engaged USEPA and GEPA to initiate a lithium-ion battery collection program to neutralize the hazardous characteristics of these batteries that can damage the collection trucks and landfills through intense fires. With the "Maui Method," lithium-ion batteries are soaked in a concentrated salt mixture for a day or two to discharge the electrical capacity, and then extreme pressure will be used to crush the battery which can eventually be safely shipped off island. Next, General Manager Slike reports that GSWA and Guahan Waste Recycling are in negotiation for a year-long pilot program to market PET and HDPE plastics. With the help of UOG, they will develop an education program for customers on appropriate materials to place in the curbside recycling bins to avoid contamination. GSWA, Guahan Waste Recycling and UOG have a scheduled meeting on March 13, 2026 to discuss this further. Secretary Denney expressed interest in attending on behalf of *i*recycle*, to which General Manager Slike agreed. Finally, GM Slike gave an update on the Biodiesel project, stating that the contractors are due to arrive on island March 16, 2026 for training and installation, and stay until March 27, 2026.

General Manager Slike then announced to the Board members that the Layon Landfill will be operated by GSWA effective Monday, March 2, 2026. Six personnel are confirmed to start, but may increase to eight. Next, a revised Island Wide Trash Collection STRAW plan was presented with tentative completion dates. GM Slike reported that GSWA is looking into detailing a UOG procurement officer to the agency, to act on behalf of GSWA to move procurement efforts forward. This is due to the requirement by the AG's office or GSWA procurement staff to obtain all four modules of procurement training. He noted difficulties in the fourth module training being offered on island. He then mentioned that Attorney Taitano circulated the



draft Rules and Regulations for the Board members to review. Chairman Gayle raised the concern of what GSWA's process would entail when a customer fails to make payment.

In regards to the IWC STRAW plan, Chairman Gayle inquired with GM Slike about the progress with Alpine, in which he explained that GSWA is currently still trying to get location data for existing customers to upload into Alpine. He added that an estimated time of completion cannot be determined. Next, Chairman Gayle asked for an update with the progress of the side loaders. GM Slike stated that GSWA now has five side loaders, with five people trained, and more still in training. The sixth side loader is also expected to arrive soon.

Next, GM Slike reported that with the increase of self-haul white goods to all transfer stations, not only did it help with the backlog, it resulted in an increase in volume of white goods, which in turn, created a budget adjustment of \$341,000 in additional funds. He then explained that several projects will be funded from the balance of excess revenues, to include Biodiesel pretreatment equipment, Alpine Training, SWANA and GFOA certifications, Comptroller Kakigi's reimbursement for her certifications, furniture for new and existing employees, and an awning over the electrical charging station at Layon Landfill, totaling \$524,711.00. Special waste is projected to add an additional unbudgeted \$600,000 to revenues this fiscal year, and Commercial and Government revenues are expected to bring another \$600,000 in as well. Finally, GM Slike informed the Board that GSWA will be reprogramming the fuel budget to pay for methanol, at the cost of \$182,000 which is still within budget.

Additionally, Chairman Gayle reminded the Board that funding for travel for himself and Attorney Mootz to attend the Global Mediation will come at the expense of GSWA. He suggested however, that Attorney Taitano and GM Slike also be in attendance to represent the agency due to the importance of the matter. Secretary Denney and Member Oehlerking agreed. Chairman Gayle explained that both travel and per diem will follow the guidelines put forth by the GovGuam Expense Rules.

On the Operations Accountability Report, GM Slike noted an improvement in the absentee rate from 12% to 8%, decreasing the amount of call outs daily. He also noted an improvement in communication between employees and management on leave requests. Chairman Gayle briefly touched on the Performance Indicators Report, and emphasized the need to improve the call answer rate. GM Slike responded that he hopes the numbers improve for February, due to the internal switch issue being resolved.



ii. FINANCIAL REPORT

Comptroller Kakigi reported that with four months into the fiscal year, an 8% upward trend in revenue is evident as a result of the rate increase. She went on to report, however, that the budget to actuals have the same overrun due to pay outs for overtime and the Receiver, but GSWA continues to stay well within budget. Then, she reminded the Board that GSWA increased their reserves significantly to fund the long-term care for the Layon Landfill with \$875,000 already set aside in the last four months, while remaining compliant with the purpose of the rate increase. Contractual expense showed a significant increase in the recycling expense. Secretary Denney then asked Comptroller Kakigi to clarify why the PUC/Legal expense is much higher in 2026, to which she explained that GSWA hired consultants at the beginning of the rate adjustment, as well as an increase in legal consultations received by GSWA's Attorney Taitano.

Chairman Gayle then asked how GSWA would budget the 2027 Fiscal Year factoring in the end of the receivership and the expenses related to the Ordot post-closure. GM Slike responded that the contract between GSWA and Brown & Caldwell was shortened, which will yield significant savings as they will no longer be needed to monitor the closed landfill. Also, additional revenue generated from the interest from the post-closure account will be another source used to mitigate any operational increase on GSWA's account. Conversation surrounding this would be discussed further offline.

Lastly, Comptroller Kakigi presented the 15-month Revenue and Tonnage chart, indicating a 71% increase in special waste, a 4% increase in commercial revenues, and a 3% increase in residential revenues respectively. The biosolids from GWA also show a 13% increase in tonnage.

b. LEGAL COUNSEL'S REPORT

Tabled.

c. COMMITTEE REPORTS

Touching back on the proposed pilot program between GSWA, Guahan Waste Recycling and UOG to introduce a public education program to address appropriate items for the recycling bins, the lithium-ion battery collection program, the biodiesel process for fuel for GSWA trucks, and other recycling efforts, Chairman Gayle suggested creating a sub-committee to effectively address public education. He asked Secretary Denney to take it on as Chairperson. A potential budget to fund the marketing and communication aspects of the program may be put aside for 2027.



VII. UNFINISHED BUSINESS

a. ISLAND WIDE TRASH COLLECTION INITIATIVE

Chairman Gayle stated that the topic was already discussed under the Operations Management Report, and to have it removed from next Board meeting's agenda.

b. LAYON CELLS 1 AND 2 CLOSURES

General Manager Slike submitted a packet to reinstitute the federal grant that was circulated to all GovGuam agencies offered by BBMR, requesting federal funding for solar panels and closure monies for cells one and two.

c. SUCCESSION PLANNING

Currently there are no candidates for a qualified Assistant General Manager, and recruitment is ongoing.

VIII. NEW BUSINESS

- ### **a. BOARD RESOLUTION NO. 2026-003 - Relative to the Approval and Reimbursement for Professional Membership Fees for the GSWA General Manager and Comptroller; motion to approve by Member Oehlerking, seconded by Secretary Denney, and unanimously approved.**

IX. COMMUNICATIONS AND CORRESPONDENCE

None.

X. PUBLIC FORUM

a. BART CRUZ – MISSED SERVICES/CUSTOMER SERVICE

Chairman Gayle confirmed that he and GM Slike reached out to Mr. Bart Cruz after the January Board meeting and discussed his suggestions and input.

XI. EXECUTIVE SESSION

None.

XII. NEXT MEETING

The next Board meeting is scheduled to be held on March 19, 2026 at 1:00pm via video conference.

XII. ADJOURN

A motion was made by Secretary Denney to adjourn the GSWA Board of Directors meeting, which was seconded by Member Oehlerking. The motion passed unanimously and the February 26, 2026 Board meeting was adjourned at 2:45pm.

February 26, 2026 Operations Report

GSWA and Guahan Waste Recycling are negotiating a yearlong pilot program to finally market PET plastic and HDPE plastic. Since 2019 there essentially has been no market for this material, the material was landfilled and was paid for under the “contamination rate” under the contract.

GSWA, Guahan Waste Recycling, and potentially UOG will develop and sustain an education program throughout the pilot program to educate customers on appropriate materials to place into the recycle bins. Prior contamination rates have exceeded 70%.

A report will be generated in the amount collected, the cost of collection, processing and marketing, and the costs associated with the education program.

The parties met Friday March 13 to discuss the project. UOG will draft a proposal for education and education program, Guahan Waste will finalize the one-year pilot program, and GSWA will develop a customer delivery and performance program

The Manufacturer installers have arrived and begun installation and will stay until March 27th.





The National Laboratory of the Rockies (Formally the National Renewable Energy Laboratory) has recently completed a high level WTE assessment for waste quantities on Guam. The Final Study is included as information.

GSWA has 9 trucks in operation:

6389, 6390, 6393, 7531, 7563, 7564, 5524, 8067, 8068

- One Down for repair
- 6394: PTO and Hydraulic system
- 6391: Front suspension damaged

GSWA is on track to secure approximately 14 total full time and temporary to staff Layon.

Island Wide Straw Plan revised

MOA with GWA for customer base Distributed Draft in Feb Ready for Board Adoption March meeting

Rules and Regs Working Draft distributed Feb Board Meeting GSWA adopt June 2026

AAA adoption 6 months December 2026 Hard Deadline or required reintroduction to Legislature

Confirmation of potential IWC rate dependent on RFP approval blocked by inability of GCC to offer training No movement to date

Cart Monies for Refuse carts only \$2 million. Early to Mid-2027 with Special Waste and GGH savings. Sooner if other Non GSWA funding sources discovered.

Cart Procurement 3-month manufacture May 2027

Cart Distribution and Start of Island Wide June 2027 thru April 2028 10 months

NATIONAL LABORATORY OF THE ROCKIES

Date: January 22, 2026

To: Jonathan Dunn, U.S. Department of the Interior Office of Insular Affairs
John Cruz, Guam Power Authority
Irvin Slike, Guam Solid Waste Authority
Rebecca Respicio, Guam Energy Office

From: Anelia Milbrandt, Sydney Harris, Michael Talmadge, Kelcie Kraft, Ling Tao
National Laboratory of the Rockies (NLR)

Subject: Waste-to-Energy Potential in Guam

Purpose

This memo summarizes key findings from an analysis of waste-to-energy (WTE) potential in Guam, considering local waste resources, technology options, market opportunities, and strategic considerations to inform WTE and waste-to-products development.

Key Takeaways

Local waste feedstocks provide limited potential for energy displacement, offsetting less than 1% of grid electricity demand and liquid fuel consumption. As a result, WTE is best viewed as a supporting strategy rather than a bulk energy solution.

A review of published capital and operating cost data indicates:

- **Electricity:** Anaerobic digestion of food waste and gasification of municipal solid waste- (MSW-) derived feedstocks appear to be promising electricity pathways
- **Liquid fuels:** Biodiesel production from used cooking oil and hydrothermal liquefaction (HTL) of wet wastes represent the lower-cost liquid fuel options. Pyrolysis to bio-oil and gasification to Fischer–Tropsch liquids from MSW are higher-cost pathways but could contribute larger fuel volumes if market conditions and economics support deployment.

Given feedstock limitations and cost considerations, *small-scale, distributed WTE systems* located at facilities with steady energy demand such as wastewater treatment plants, hospitals, schools, and large hotels, may be more feasible than centralized facilities. These applications can provide enhanced resilience, particularly during fuel supply disruptions.

Overall, the primary value of waste utilization lies in *waste minimization, meeting diversion targets, and producing locally usable products*, rather than maximizing bulk energy generation.

Considerations for Strategic Focus Areas

To align waste management and energy goals, the following strategic priorities could be considered:

- *Preserve high-value recyclables* (e.g., metals, clean aluminum, corrugated cardboard) for established recycling markets to maintain economic value and avoid unnecessary diversion into WTE pathways
- *Expand reuse and recycling of specialty waste streams*, including:
 - *Textiles*: Support resale, donation, upcycling, or recycling into industrial rags, insulation and sound-dampening materials, or regenerated fibers for new textile products
 - *Waste tires*: Promote reuse in rubberized asphalt and road surfacing, playground and athletic surfaces, and tire-derived aggregate; pursue recycling via pyrolysis into fuel oil or recovered carbon black where markets exist
- *Prioritize low-value, hard-to-recycle materials* (e.g., mixed plastics, contaminated paper, residual organics) for WTE or waste-to-products applications where recycling markets are limited
- *Focus on niche, high-value energy applications* such as combined heat and power, microgrids, and service to critical facilities, with larger-scale energy production considered on a case-by-case basis where economics and market conditions allow
- *Emphasize locally usable products and co-products*, including compost or biochar for soil amendment or building materials, digestate as fertilizer, and other outputs that can be consumed on-island to retain value from local waste streams and minimize disposal or export of materials.

Conclusion

Taken together, these findings suggest that a diversion-first, market-aware strategy focused on expanding reuse and recycling opportunities, emphasizing locally consumed products, and deploying WTE selectively for low-value materials and resilience-oriented applications, offers the most practical and cost-effective path forward. Recognizing that WTE solutions are currently not allowed by Guam legislation (Guam Public Law 25-175), potential next steps include discussing priorities and opportunities with relevant stakeholders, evaluating market readiness in more detail, and ensuring policy makers are informed of current WTE applications and considerations.

The *NLR Waste-to-Energy Potential in Guam* slide deck (2026), which provides additional detail, is available at: <https://docs.nlr.gov/docs/fy26osti/98945.pdf>.

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NLR/OT-6A20-98948 • March 2026

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NATIONAL
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OF THE ROCKIES

Waste-to-Energy Potential in Guam

Anelia Milbrandt, Sydney Harris, Michael
Talmadge, Kelcie Kraft, Ling Tao
January 9, 2026

Waste-to-Energy

Waste-to-Energy (WTE) is conversion of waste materials into electricity, heat, transportation fuels, chemicals, and other products using a variety of processes as outlined below.

Commercial Applications

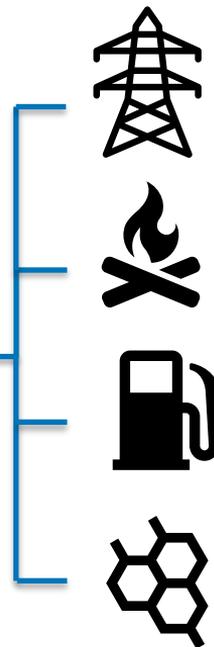
- Combustion
- Gasification
- Pyrolysis
- Anaerobic digestion (AD)/landfill gas recovery
- Transesterification of fats, oils, and greases to biodiesel
- Hydroprocessing of fats, oils, and greases to alternative fuels (e.g., diesel, jet fuel, heating oil)

Advanced Applications

- Hydrothermal liquefaction (HTL) of organic waste to alternative fuels
- Hydrothermal carbonization (HTC) of organic waste to hydrochar used as solid fuel, soil amendment, and adsorbent
- Advanced AD (e.g., arrested methanogenesis, anaerobic membrane reactors, and various pre- and post-treatment strategies) to alternative fuels and chemicals.



Photo by David Parsons, NLR 05289



Background

- Pacific island territory of the United States
- Land area ~210 sq. mi. with limited landfill space
- Population and municipal solid waste (MSW) disposal are projected to grow.
- Average annual MSW disposal from 2013–2021 was **1,147 lbs. per capita.**

Population and MSW Projections through 2040

Year	Population	Total MSW Disposal (tons)
2020	153,863	98,000*
2025	173,034	100,600
2030	179,932	103,600
2035	182,022	104,800
2040	183,580	105,700

Source: Guam EPA Integrated Solid Waste Management Plan 2023
*Represents 2019 disposal

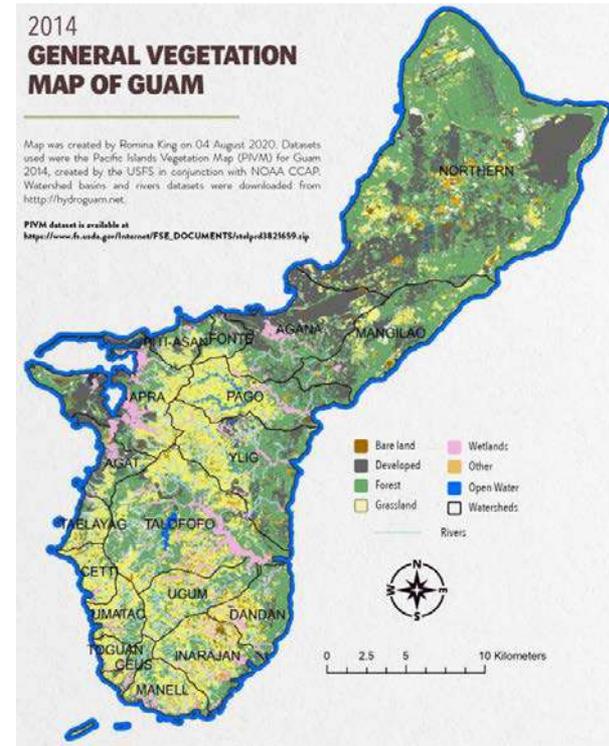


Image from https://www.uog.edu/_resources/files/wp/2024-wptrc-magic-lab-guam-forest-action-plan-reduced.pdf

Background (cont.)

Current MSW Management (2017)

- 44% landfilled
- 30% recycled
- 14% composted
- 12% hardfill – inert materials disposed separately

System Infrastructure and Policies

- **Disposal system:** Waste consolidated at three transfer stations and hauled to Layon Landfill (the island's only lined MSW landfill)
- **Recycling:** On-island material recovery facility sorts single-stream recyclables
- **Organics management:** Dedicated facilities for composting and wood processing
- **Landfill bans (since 2008):** Yard and vegetative waste, untreated wood, inert materials, metals, household hazardous waste, and corrugated cardboard.

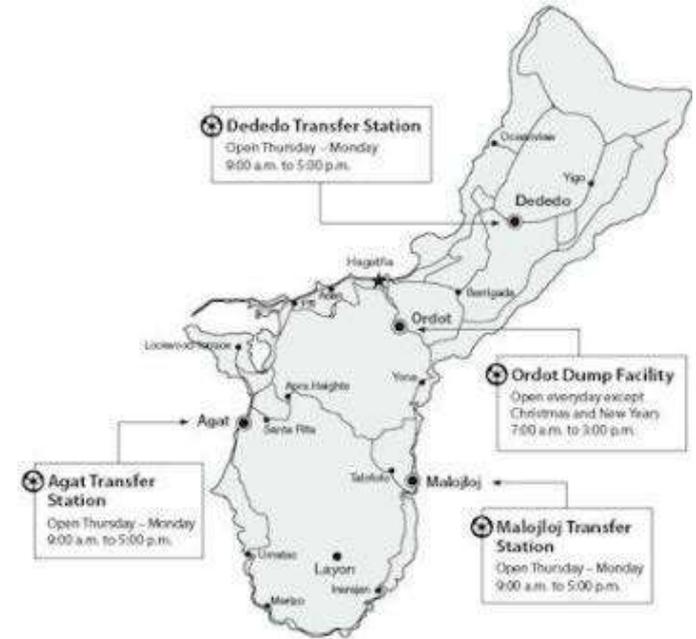


Image from <https://uscdiving.wordpress.com/2012/05/18/the-ordot-dump-and-layon-landfill/>

Waste to Energy Resources in Guam

Municipal Solid Waste (MSW):

- Food waste
- Paper and cardboard
- Plastics
- Waste tires
- Textiles
- Wood
- Yard waste

Agricultural waste:

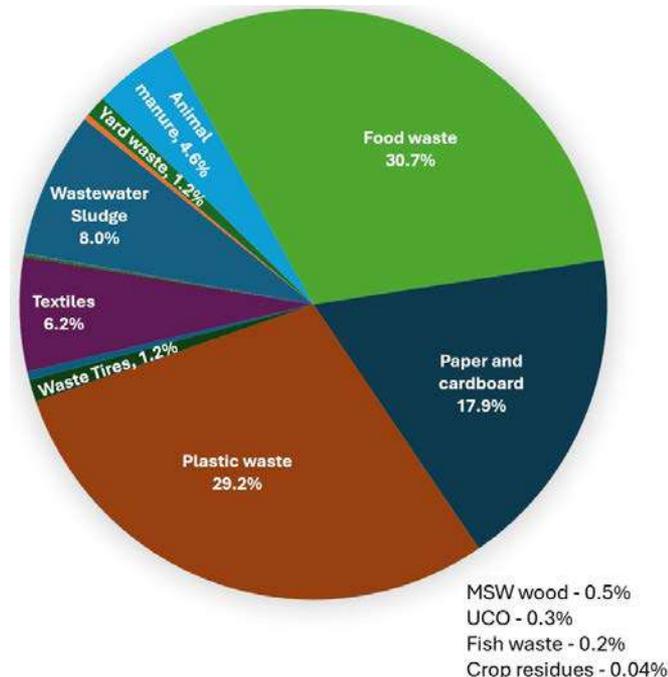
- Crop residues (corn stover and coconut husks)
- Animal manure

Industrial/commercial waste:

- Fish waste
- Wastewater sludge
- Used cooking oil (UCO)

Breakdown of Waste Resource Availability

Estimated total waste resources ~124,000 wet tons per year



Source: Various data providers; data generation and analysis by NLR

Waste to Energy Potential in Guam

Feedstock	Technology	Biofuel/ Biopower	Bioenergy Potential (Gigawatt-hours (GWh) for power and thousand diesel gallon equivalent/yr for fuels)*
Food waste, manure, sludge, fish waste, UCO, crop residues	AD	Power	10.4 GWh
UCO	Transesterification	Biodiesel	88.2
UCO	Hydrotreating	Renewable diesel, Sustainable Aviation Fuel (SAF)	84.7
MSW (paper, plastic, waste tires, wood, food waste, yard waste, textiles)	Gasification	Power	61.6 GWh
Food waste, manure, sludge, fish waste, UCO, crop residues	AD	Bio-LNG (Liquified Natural Gas)	889
Food waste, manure, sludge, fish waste, UCO, crop residues	Steam Methane Reforming of Renewable Natural Gas via AD	Bio-methanol	774
Crop residues	Fermentation to ethanol + catalytic upgrading	SAF	0.39
MSW (paper, plastic, waste tires, wood, food waste, yard waste, textiles)	Ex-situ Catalytic Fast Pyrolysis	Bio-oil (could be upgraded to renewable diesel and SAF)	3,348
MSW (paper, plastic, waste tires, wood, food waste, yard waste, textiles)	Gasification	Bio-methanol (SAF also possible)	4,664
Food waste, manure, sludge	Hydrothermal Liquefaction + Mild Hydroprocessing	Bio-crude (could be upgraded to renewable diesel and SAF)	1,219



Commercial

Mid-Level (Commercial & Still Under Development)

Under Development with Limited Commercial

*WTE potential values for each feedstock are exclusive of each other; not additive

Market Overview: Power and Heat

Current Electric System, Demand, and Prices

- Peak demand in 2022 was 260 megawatts (MW) and total electric sales were 1,540 GWh.
- There are 464 MW of installed capacity, of which 85 MW are renewable (solar), remaining capacity is mainly diesel-fired units.
- Guam Power Authority (GPA) recently commissioned a new 198 MW power plant that can be run on LNG, although current fuel is diesel.
- Prices: Average retail rate including fuel surcharges was around \$0.268/kWh in 2025.

Waste to Energy Opportunities

- **Biogas/Landfill Gas (LFG):** Can be used for heating and power generation
 - Ordot landfill has a gas collection system installed; the gas is flared, not utilized.
- **On-site and district combined heat and power (CHP):** Facilities with steady thermal demand (wastewater treatment plants, hospitals, industry, schools, large hotels) could use WTE heat and power.
- **Microgrids:** WTE co-located at critical facilities could support microgrids, improving energy security and system resilience.
- **Grid electricity:** Power via WTE could be sold to GPA via power-purchase agreement or utility ownership, displacing high-cost diesel generation.



Photo by Dennis Schroeder, NLR 62203

Market Overview: Fuels

Fuel Dependence

- Guam has no domestic oil or gas production and relies entirely on imported foreign petroleum products (primarily from Asia).
- Diesel fuel (mainly for power generation) accounts for 53% of petroleum sales—motor gasoline is 26%, jet fuel is 19%, and propane is most of the remainder.

WTE Opportunities

- **Biogas/biomethane:** Can be used as vehicle fuel; potential to supplement LNG at Ukudu if it operates on gas
- **Liquid fuels (e.g., biodiesel, renewable diesel):** Potential supplemental fuel for GPA, industry, or maritime sector
 - The Guam Solid Waste Authority (GSWA) has procured biodiesel production equipment capable of converting up to 12,000 gallons of UCO per month into ASTM D6751-compliant biodiesel.
- **Solid fuels (pellets/refuse-derived fuel [RDF]):** Possible on-island thermal use in boilers, but limited solid-fuel infrastructure (cement, steel) may constrain market viability.



U.S. Department of Energy flickr 530 002 001

Market Overview: Products

Compost

- Residential backyard composting and five privately operated commercial facilities are active on the island.
- In addition to traditional composting (windrow and aerated static pile), in-vessel composting could be explored due to superior odor, vermin, and process control, particularly in sensitive or space-constrained areas.

Biochar (via pyrolysis)

- Organic waste: Soil amendment for agriculture, landscaping, golf courses; stormwater and wastewater filtration media; additive in construction materials
 - Pyrolysis of wastewater sludge can achieve high PFAS destruction efficiencies, and the resulting biochar may be suitable for land application.
- MSW: Building material, for road surfacing, or potential solid fuel source in industrial applications
- Waste tires: Recovered carbon black (rCB) can be reused in various rubber applications.



Photo by Dennis Schroeder, NLR 47115

Market Overview: Products (cont.)

Digestate (coproduct of AD)

- Potential uses: Fertilizer or soil conditioner for local agriculture, municipal grounds, and landscaping, partially offsetting imported fertilizer costs; solids could be used as animal bedding
- Quality control (pathogens, contaminants, salinity) and a clear product standard are often critical to acceptance.

Pellets (densification)

- Organic waste: Industrial applications, soil amendment
 - Paper pellets can be used as fuel, animal bedding, cat litter
- MSW (refused-derived fuel): Industrial application (e.g., cement kilns, power plants).



Photo by Dennis Schroeder, NLR 30633

Key Takeaways

- Local waste feedstocks provide **limited energy displacement (<1% of grid demand and fuel consumption)**.
 - Cost data review (see backup slides):
 - **Electricity:** AD of food waste and gasification of MSW-derived waste could be promising pathways for electricity production; gasification's higher conversion efficiency results in more competitive costs per unit of power than combustion.
 - **Liquid Fuels:** Biodiesel from UCO and HTL of wet wastes represent the lower-cost liquid fuel options. Pyrolysis to bio-oil and gasification to Fischer–Tropsch liquids from MSW are higher-cost pathways but could enable larger fuel volumes if markets and economics support deployment.
- **Small-scale, distributed WTE systems** at facilities with steady energy demand (e.g., wastewater treatment plants, hospitals, schools, large hotels) may be more feasible than centralized options, offering enhanced resilience.
- The primary value of waste utilization lies in **waste minimization, meeting diversion targets, and producing locally usable products**, rather than bulk energy generation.

Considerations for Strategic Focus Areas

- Preserve **high-value recyclables** (e.g., metals, clean aluminum, corrugated cardboard) for existing markets.
- Expand reuse and recycling of **specialty waste streams** such as:
 - **Textiles:** Resale, donation, upcycling or recycling (e.g., industrial rags, insulation and sound-dampening materials, or regenerated fibers for new textile products)
 - **Waste tires:** Reuse in rubberized asphalt and road surfacing, playground and athletic surfaces, and tire-derived aggregate; recycling via pyrolysis into fuel oil or rCB
- Prioritize **low-value, hard-to-recycle materials** (e.g., mixed plastics, contaminated paper) for WTE/Waste-to-Products applications.
- Focus on **niche, high-value applications** (e.g., CHP, microgrids, critical facilities) rather than bulk energy production.
- Emphasize **locally usable products** (e.g., compost/biochar as soil amendment or building material, digestate as fertilizer, etc.).

Key Challenges

1. Limited land and long-term capacity
2. High system costs and affordability
3. Participation and contamination
4. Market dependence and exports
5. Meeting diversion targets (50% diversion by 2035; 75% waste reduction by 2040)

Potential Next Steps

- Engage relevant stakeholders to clarify goals, priorities, and decision criteria for waste diversion, product and energy recovery.
- Identify near-term opportunities (such as expanding reuse and recycling markets for high- and specialty-value materials) and assess associated logistics and implementation needs.
- Evaluate market readiness, policy considerations, and deployment requirements to inform phased or pilot-scale implementation of WTE/waste-to-product applications (e.g., AD, in-vessel composting, biochar).

Case Studies

Commercial Anaerobic Digestion on the Canary Islands

- Canary Islands face high waste management costs, tourism-driven organics, and full dependence on imported fossil fuels – similar context to Guam.
- ATH Bioenergy is building a semi-dry AD project across four islands to process organic waste (hotel food waste, supermarket, pruning and banana residues, food-industry waste).
- Anticipated to produce >133 GWh/yr of biomethane and roughly 6,700 tons/yr of organic fertilizer.

Island	Plant Capacity (ton/yr)
Gran Canaria	~31,000
Tenerife	~35,000
Fuerteventura	~32,000
Lanzarote	~30,000
Total	~130,000

Commercial Anaerobic Digestion on the Canary Islands (cont.)

- The biomethane will be used to displace imported liquefied petroleum gas and other fuels for heat and hot water at hotels/industry.
- The project represents a roughly €100 million (~118 million USD) investment from private developers with InvestEU support.
- Construction began in 2024 and completion is anticipated in 2026.
- Policy drivers include:
 - Spain's Waste Law requiring 55% organic recycling by 2025.
 - Building codes requiring >70% renewable energy for domestic hot water.
- Represents private IPP development – plants will be financed, built, and operated privately without the need for the utility to own generation.

American Samoa WTE – Gasification Plant

- Feedstock: MSW (e.g., green waste, plastics, tires, wood, paper)
- Constructed on a three-acre lot by a landfill
- Foundation construction underway; expected to be in operation by the end of 2026
- Received U.S. EPA permit; received local land use permit for construction
- Capacity: >70 tons of MSW/day
- Generation: 1 MW per month
- Main benefit: extends the life of the landfill
- Biochar is used for landfill cover

Source: Tuato'o, Ryan, 2025. "American Samoa Power Authority Waste to Energy Project." Presented at Office of Insular Affairs Territory Energy Coordination Meeting, Sept. 4, 2025, Washington, D.C.



Photos provided by American Samoa Power Authority

Waste-to-Energy Combustion on Oahu (H-POWER Hawaii)

- Oahu generates ~1.8 million tons/year of solid waste; with limited landfill capacity, Honolulu relies on WTE as its cornerstone disposal strategy.
- Honolulu Program of Waste Energy Recovery (H-POWER) is operated by Covanta under contract with Honolulu.

Metric	Value
Technology	Mass-burn WTE + front-end recycling and metals recovery
Feedstock	MSW + commercial waste
Throughput	~700,000 tons/yr
Electric output	~90 MW gross; ~60 MW delivered to Hawaiian Electric; covers 8–10% of Oahu's electricity
Landfill Diversion	~70% of Oahu's MSW diverted
Commissioned	Units one and two in 1990; third unit added in 2012

Waste-to-Energy Combustion on Oahu (H-POWER Hawai'i)(cont.)

Key Successes

- H-POWER displaces imported oil on a historically fossil-fuel dominated grid and provides stable dispatchable power to complement Hawaii's increasing solar/wind energy.
- Long-term public-private partnership enabled capital investment and professional operations without requiring utility ownership and has kept pricing predictable.
- Island geography makes landfill alternatives essential – the WTE facility extends landfill life and stabilizes waste-disposal costs.



Photo by David Humber, NLR 01371

Textile Recycling Pilot: Fairfax County, Virginia

- Launched in early 2025 in partnership with Helpsy to make it easier for residents to recycle clothing, footwear, linens, and other household textiles
- Collection containers placed at local transfer station and landfill
- By October 2025, nearly **49 tons** of textiles had been collected, far exceeding early expectations and prompting operational adjustments.
- Collected items are sorted for the highest and best use — including resale, donation, upcycling, or recycling — with most materials reused rather than landfilled.
- Based on early success, the county plans to expand textile collection to additional facilities as the program continues.



Photo by Warren Gretz, NLR 06482

In-Vessel Composting: Nederland Transfer Station, Colorado

Operator: Boulder County

Feedstock: Food waste and wood chips

Capacity: 360 tons/year

Year Installed: 2024

- **Objectives:** Reduce landfill waste and transportation costs, improve composting efficiency with minimal labor, and produce high-value compost for community use
- **Local participation:** Residents actively participate by dropping off their recyclables and food waste.
- **Product utilization:** The finished compost will be utilized for local projects within the county and is planned for distribution to local gardeners.

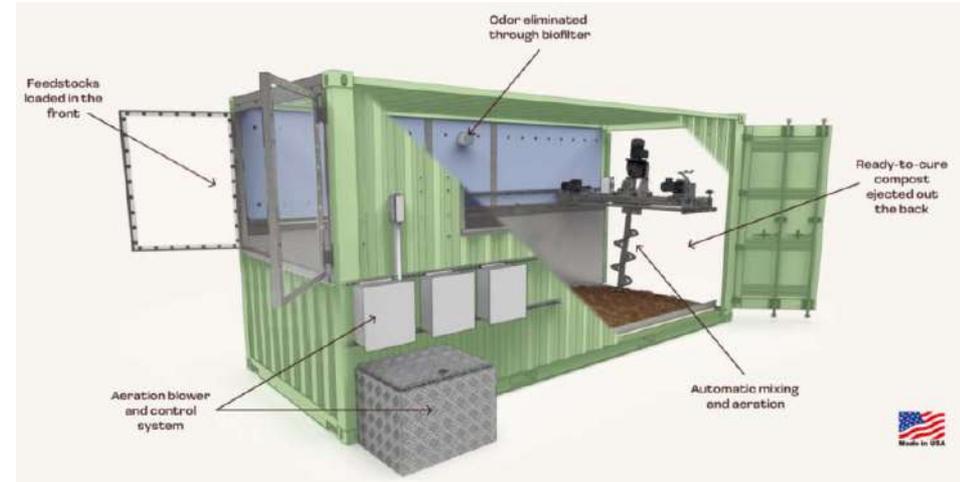


Image from Green Mountain Technologies, [Earth Flow™](#)

Pyrolysis of Wastewater Sludge to Biochar: Silicon Valley Clean Water, Redwood City, California

- **Year Installed:** 2017
- **Feedstock:** 7,000 tons of biosolids
- **Equipment:** Six BioDryers and one Pyrolysis system supplied by Bioforcetech
- The self-sustained and automated process ensures high-quality biochar output without the need for fossil fuels:
 - The BioDryers only require 220 kWh/ton of energy to remove all moisture from biosolids, and the pyrolysis system produces 150 kW of energy 24/7, which is used to run the facility.
- Biosolids reduction up to 90% by weight
- Bioforcetech Sigma Pyrolysis system achieves **99.98% PFAS removal** across all output streams, including biochar, discharge water and exhaust gases (confirmed by independent testing).



Image from Microsoft Stock

Pyrolysis of Waste Tires in Nigeria

- A Nigerian company specializing in waste recycling is facing a growing pressure to manage the increasing volume of end-of-life tires.
- Beston Group was selected as the technology provider.
- The project has successfully completed installation and commissioning and is now operating steadily.
- Processing capacity: 10–12 tons of waste tires per batch, with an annual processing volume of up to 4,000 tons
- Products: rCB and pyrolysis oil (oil yield about 40%)
- Expansion plan: The company is currently gaining operational experience to support the future integration of plastic and oil sludge pyrolysis.



Image from Microsoft Stock

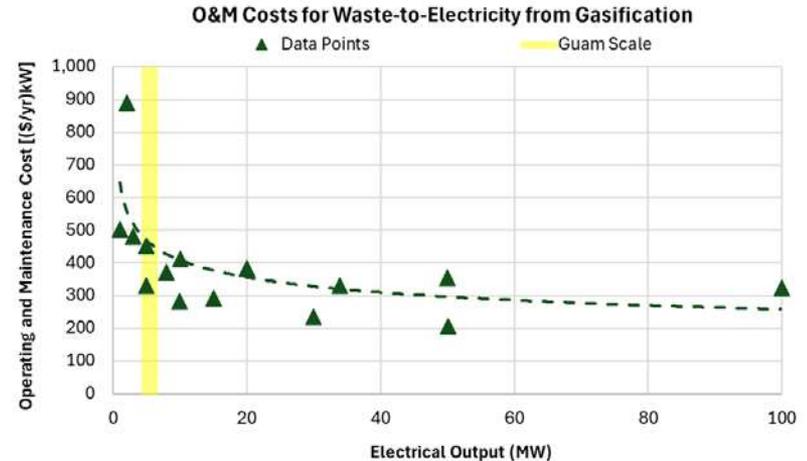
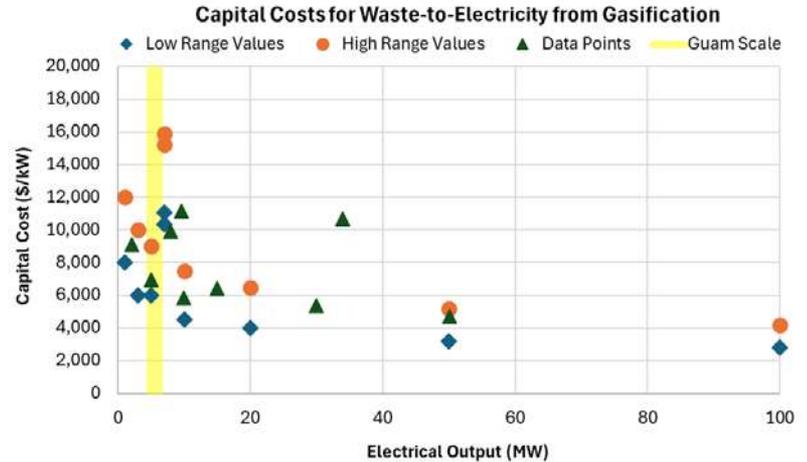
Capital and Operating Cost Ranges for Waste-to-Energy Pathways

Gasification, Combustion/Thermal Incineration, Pyrolysis,
Hydrothermal Liquefaction, Biodiesel via Transesterification,
Anaerobic Digestion, Landfilling with Gas Recovery

Gasification to Electricity

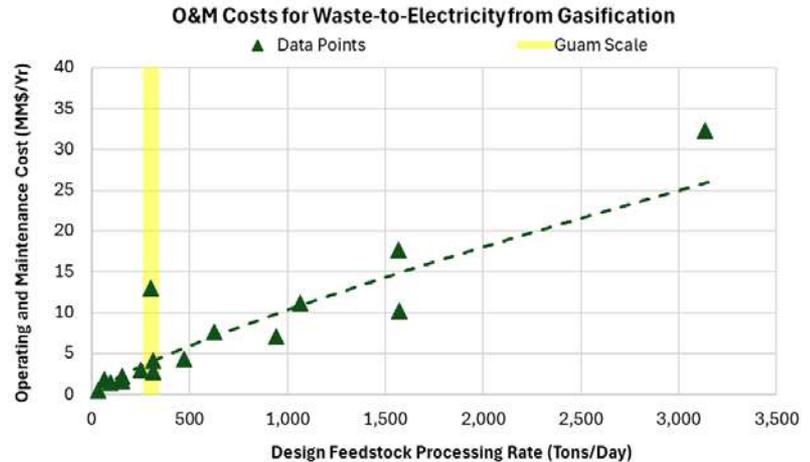
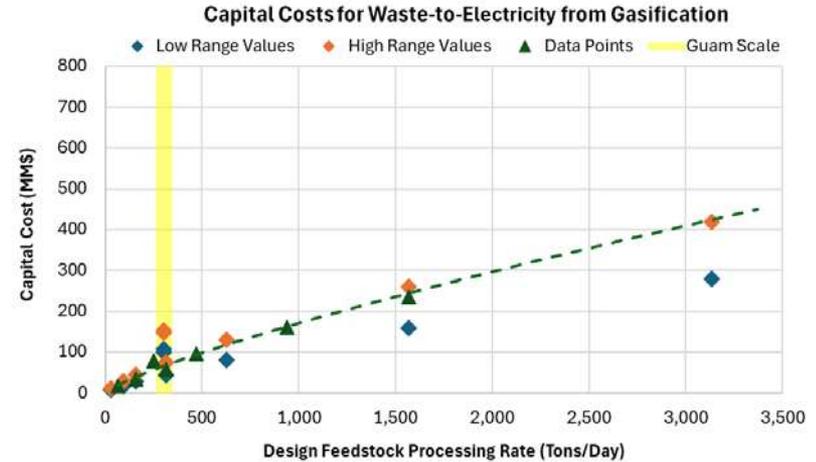
(By Electrical Output)

- **Products:** Electricity, thermal energy, synthesis gas or syngas (CO and H₂), solid residues (ash)
- **Yield:** 800 – 1,000 kWh per ton (varies with feedstock quality and technology)
- **Capital Costs:** \$6,000 – 12,000 /kW
- **Annual Operations and Maintenance (O&M) Costs:** \$300 – 500 /kW
- **Technology Maturity:** Commercial gasification facilities are well-established in Europe. Several facilities (mainly coal) in operation in the U.S.
- **Advantages:** Higher overall efficiency and lower emissions than combustion.



Gasification to Electricity (By Feedstock Throughput)

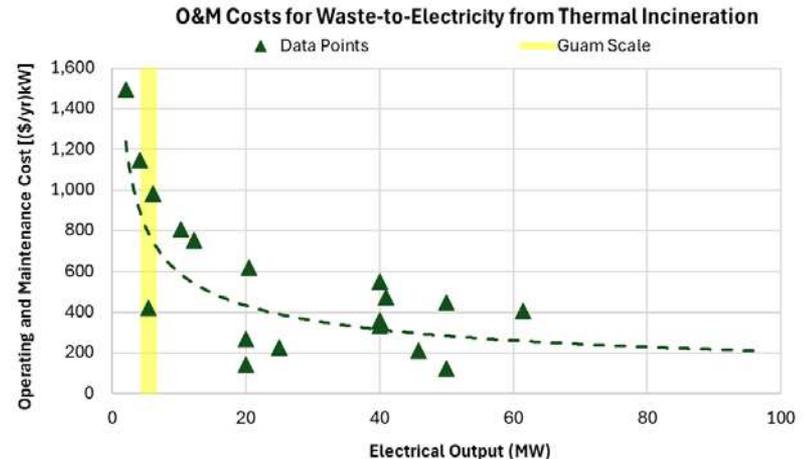
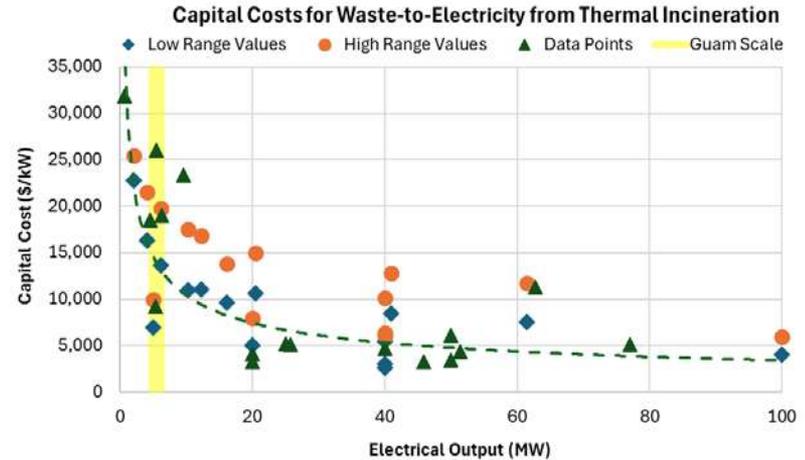
- **Products:** Electricity, thermal energy, synthesis gas or syngas (CO and H₂), solid residues (ash)
- **Yield:** 800 – 1,000 kWh per ton (varies with feedstock quality and technology)
- **Capital Costs:** \$50 – 150 Million
- **Annual O&M Costs:** \$3 – 5 M
- **Technology Maturity:** Commercial gasification facilities are well-established in Europe. Several facilities (mainly coal) in operation in the United States.
- **Advantages:** Higher overall efficiency and lower emissions than combustion.



Combustion to Electricity

(By Electrical Output)

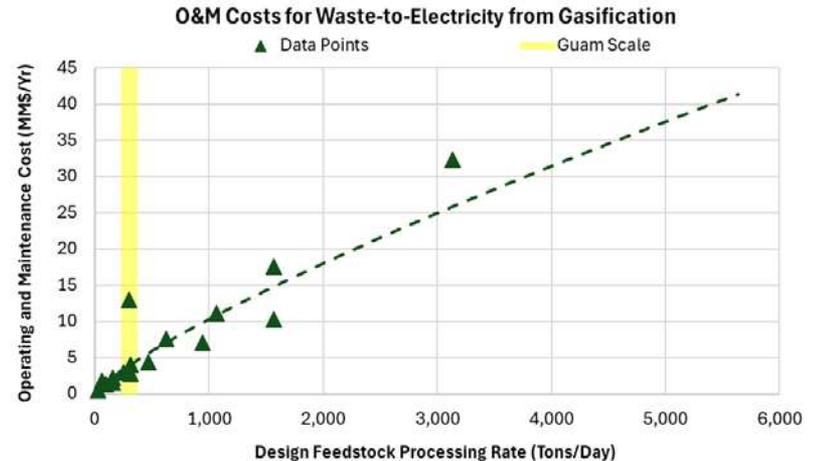
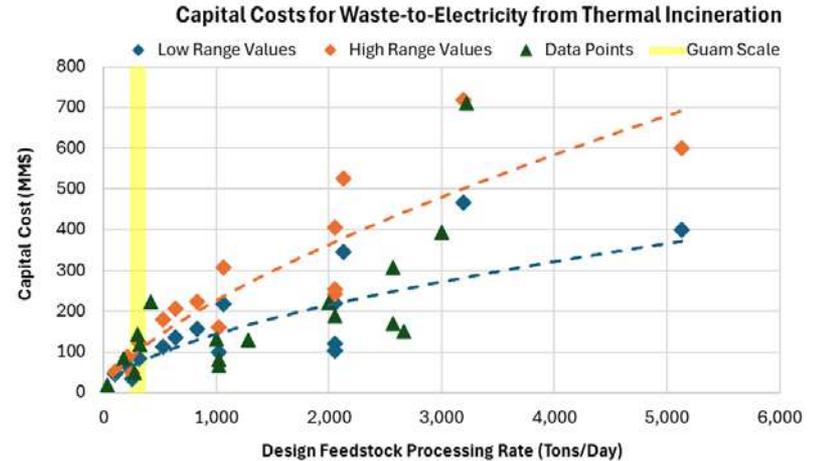
- **Products:** Electricity, thermal energy, flue gas (CO₂, water), solid residues (ash)
- **Yield:** 500 – 600 kWh per ton (varies with feedstock quality and technology)
- **Capital Costs:** \$10,000 – 20,000 /kW
- **Annual O&M Costs:** \$400 – 1,000 /kW
- **Technology Maturity:** Commercial applications around the world. Emissions control is important element of process designs.
- **Advantages:** Mature technology. Lower overall capital costs than alternatives.



Combustion to Electricity

(By Feedstock Throughput)

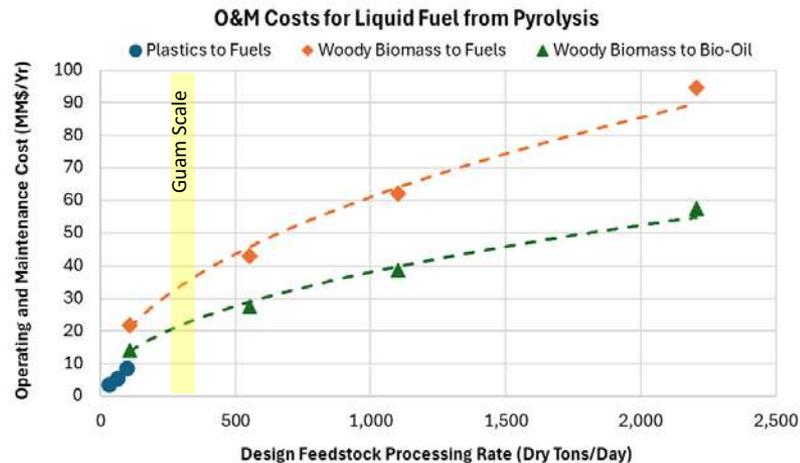
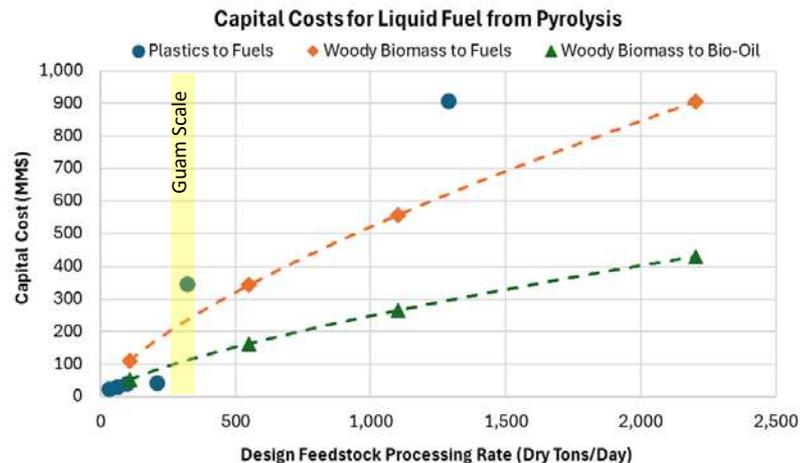
- **Products:** Electricity, thermal energy, flue gas (CO₂, water), solid residues (ash)
- **Yield:** 500 – 600 kWh per ton (varies with feedstock quality and technology)
- **Capital Costs:** \$30 – 130 M
- **Annual O&M Costs:** \$3 – 5 M
- **Technology Maturity:** Commercial applications around the world. Emissions control is important element of process designs.
- **Advantages:** Mature technology. Lower overall capital costs than alternatives.



Pyrolysis

- **Products:** Bio-oil, fuel gas, biochar
- **Yield:** Up to 120 gasoline gallon equivalent (GGE)/ton (bio-oil)
- **Capital Costs:** \$100 – 120 M (bio-oil)
- **Annual O&M Costs:** \$20 – 25 M (bio-oil)
- **Technology Maturity:** Commercial applications from Ensyn (Canada) and BTG (Europe).
- **Advantages:** Bio-oil blending with diesel/marine fuel, asphalt. Fuel gas for electricity or thermal energy. Biochar as soil amendment, construction additive, rCB.

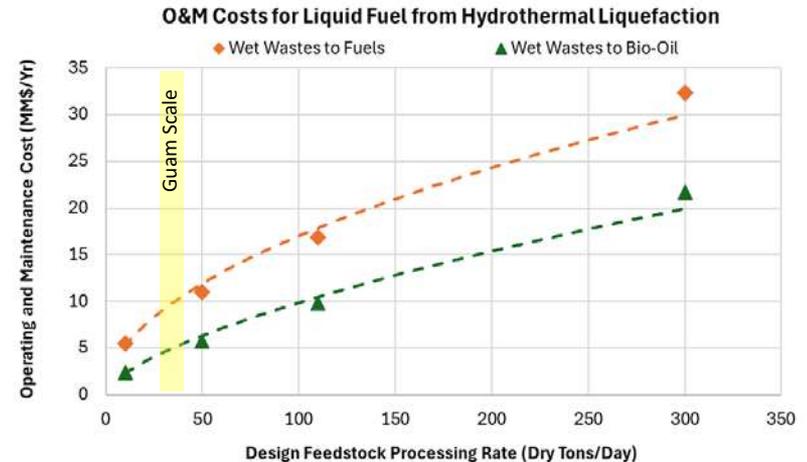
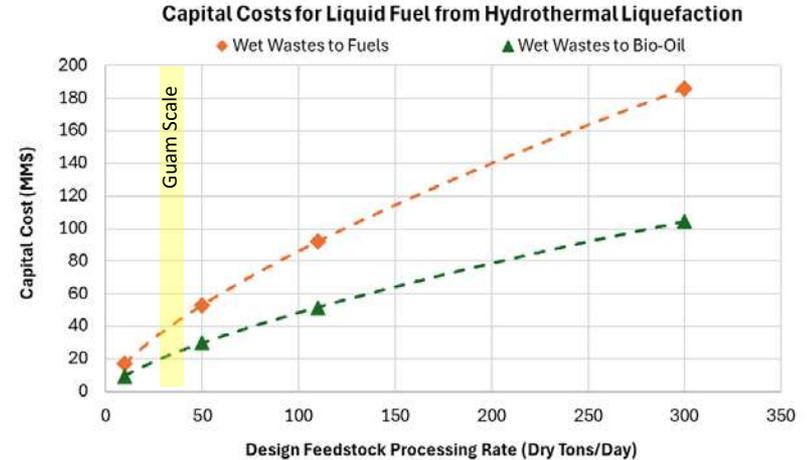
Gallons of gasoline equivalent on energy content basis.



Hydrothermal Liquefaction

- **Products:** Bio-oil, fuel gas, biochar, wastewater
- **Yield:** Up to 100 GGE/ton (bio-oil)
- **Capital Costs:** \$20 – 30 M (bio-oil)
- **Annual O&M Costs:** 4 – 6 M (bio-oil)
- **Technology Maturity:** Emerging technology at demonstration scale.
- **Advantages:** Bio-oil blending with diesel/marine fuel, asphalt. Fuel gas for electricity or thermal energy. Biochar as soil amendment or construction additive. Process is tolerant of high ash and moisture feedstocks.

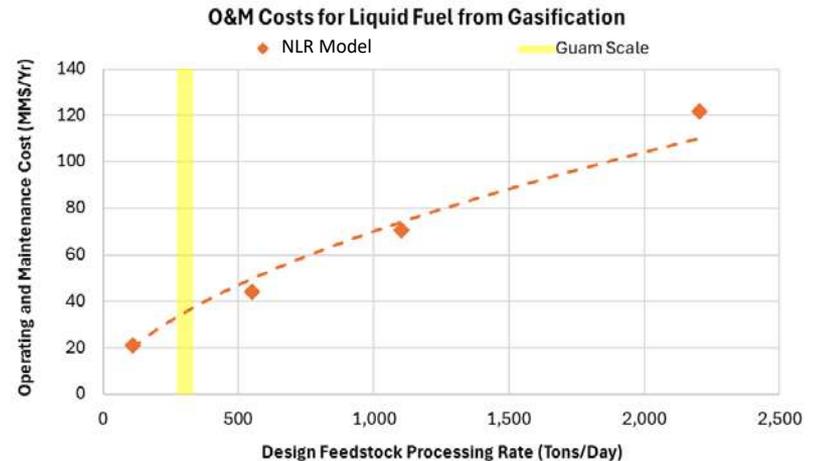
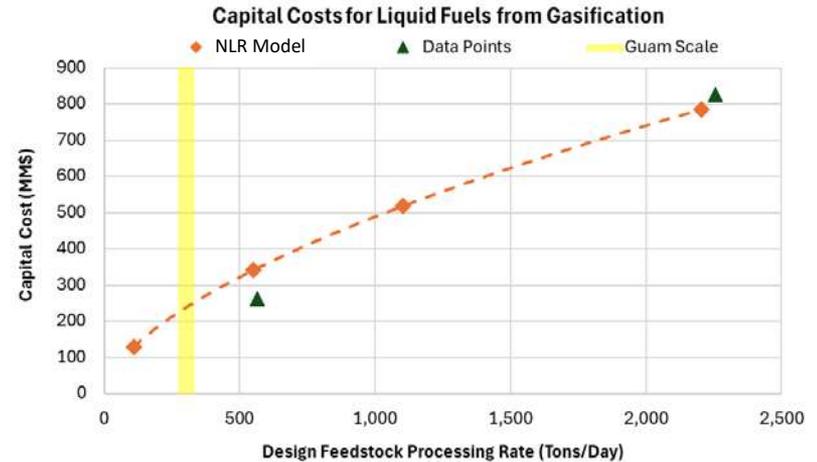
GGE = gallons of gasoline equivalent on energy content basis.



Gasification to Fuels

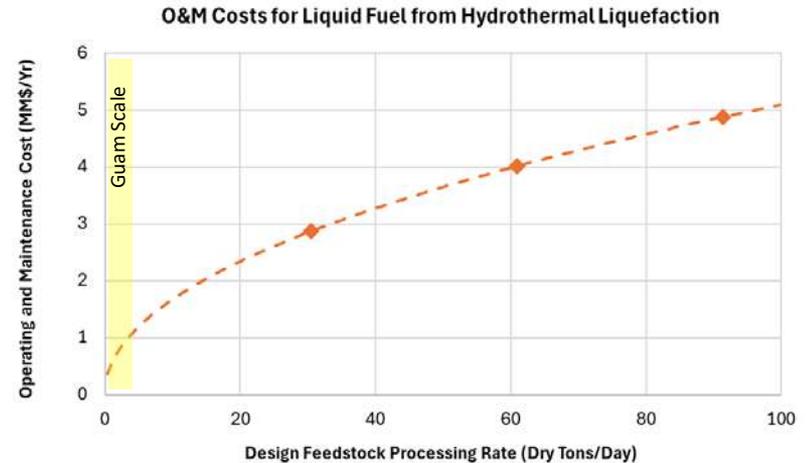
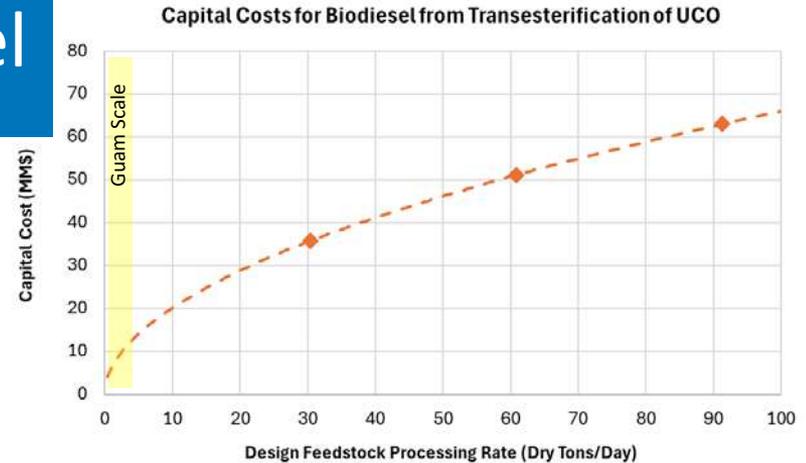
- **Products:** Fischer-Tropsch liquids, fuel gas, ash
- **Yield:** 65 GGE/ton total fuel products
- **Capital Costs:** \$200 – 300 M
- **Annual O&M Costs:** \$30 – 40 M
- **Technology Maturity:** Commercial technology for natural gas-derived syngas. Demonstration scale for biomass and MSW. Multiple technologies and designs (e.g., plasma).
- **Advantages:** High quality gasoline, diesel/marine blendstocks. Fuel gas for electricity or thermal energy. Ash/solids as soil amendment (source-dependent) or construction additive.

GGE = gallons of gasoline equivalent on energy content basis.



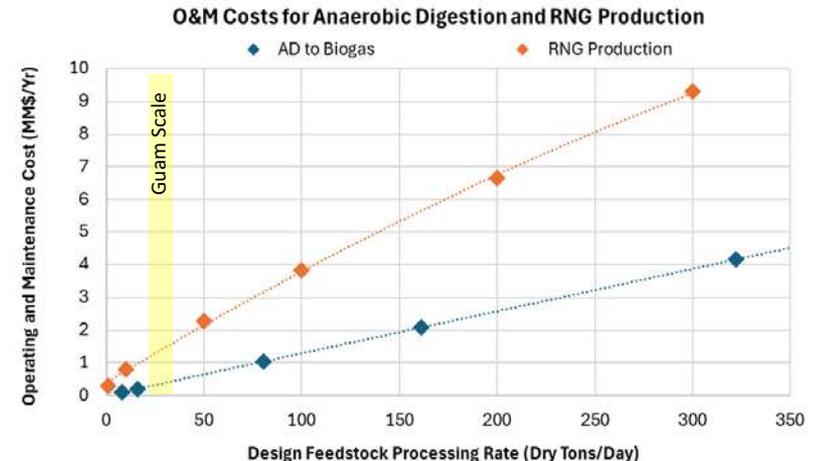
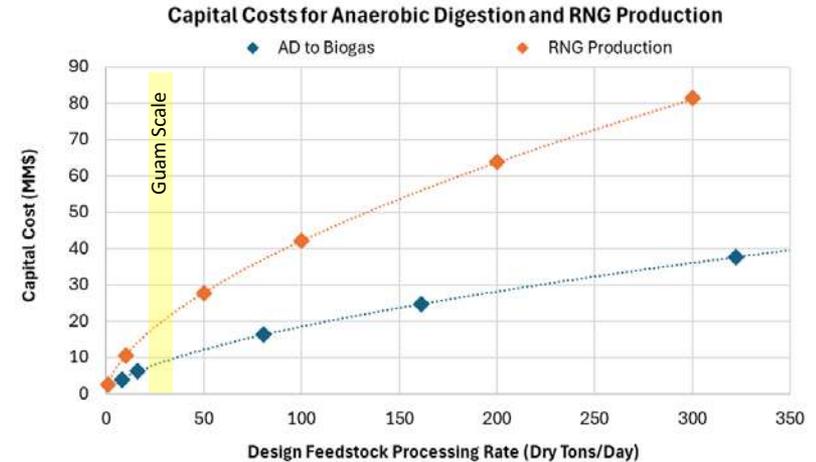
Transesterification to Biodiesel

- **Products:** Biodiesel, glycerine
- **Yield:** Up to 270 gallons per ton
- **Capital Costs:** \$5 – 10 M
- **Annual O&M Costs:** \leq \$1 M
- **Technology Maturity:** Mature, fully commercialized process
- **Advantages:** Product blending with diesel/marine fuel. No hydrogen required for fuel production like renewable diesel. Cost feasibility at small-scale.



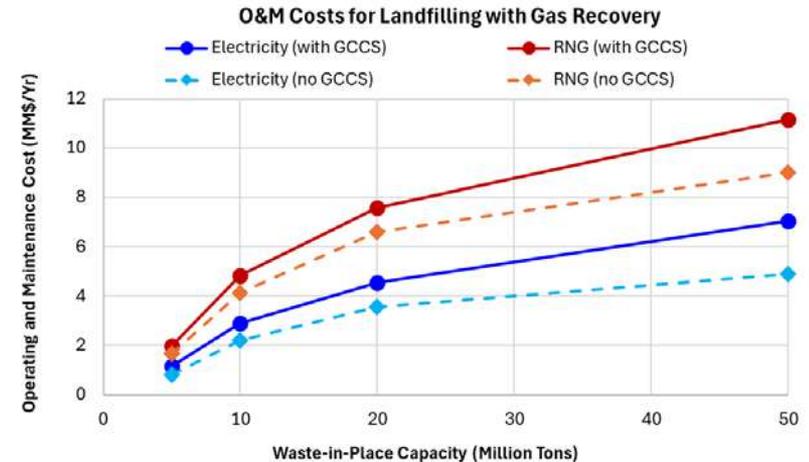
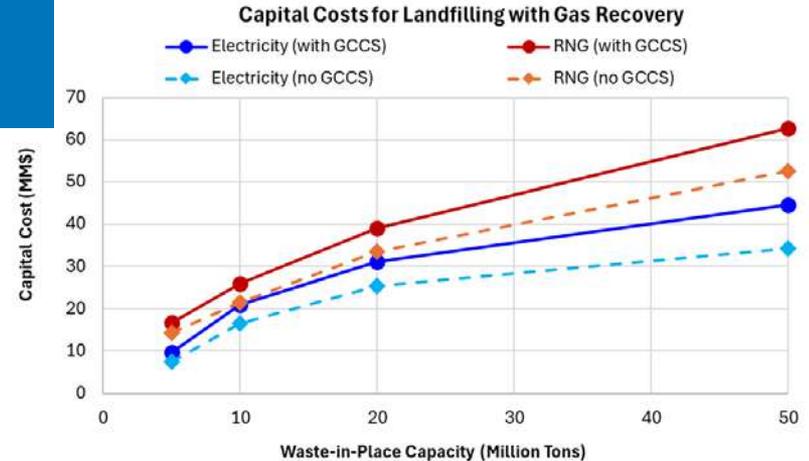
Anaerobic Digestion

- **Products:** Biogas/renewable natural gas (RNG), CO₂, digestate
- **Yield:** 0.23 Ton RNG/ton for Guam wet waste
- **Capital Costs:** \$17 – 23 M (RNG)
- **Annual O&M Costs:** \$1.2 – 1.6 M (bio-oil)
- **Technology Maturity:** Mature, fully commercialized process
- **Advantages:** Biogas for electricity or thermal energy; RNG as transportation fuel. Digestate as fertilizer, soil amendment. Process is suitable for high moisture feedstocks.



Landfill Gas Recovery

- **Products:** LFG/RNG, CO₂
- **Yield:** Lower expected yield than AD
- **Capital Costs:** Function of waste-in-place
- **Annual O&M Costs:** Function of waste-in-place
- **Technology Maturity:** Mature, fully commercialized process
- **Advantages:** LFG for electricity or thermal energy; RNG as transportation fuel. Builds on existing landfill infrastructure, reduces methane emissions, and provides a relatively low-cost WTE option where gas is already being captured or flared.



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Thank you!

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**NATIONAL
LABORATORY
OF THE ROCKIES**

PERFORMANCE INDICATORS				
RESIDENTIAL TRASH COLLECTION:	Dec 2025	Jan 2026	Feb 2026	DIFFERENCE
NO. OF TRASH COLLECTIONS:	89,316	89,556	89,776	220
MISSED SERVICE:	417	569	406	(163)
CUSTOMER SERVICE:				
EMPLOYEE COUNT (PHONES):	2	2	2	0
EMPLOYEE COUNT (WALK IN):	2	2	2	0
EMPLOYEE COUNT (EMAILS & SUPERVISION):	1	1	1	0
TOTAL EMPLOYEE COUNT:	5	5	5	0
TOTAL WALK-INS:	997	1,000	835	(165)
CALLS RECEIVED:	7,999	7,674	4,982	(2,692)
CALLS ANSWERED:	3,066	2,889	1,898	(991)
CALLS ABANDONED	3,951	3,511	3,035	(476)
ANSWER RATE:	38%	38%	38%	0
AVERAGE WAIT TIME:	0:02:18	0:02:03	0:04:04	00:02:01
AVERAGE HANDLE TIME:	0:01:58	0:02:02	0:02:39	00:00:37
AVERAGE TIME TO ABANDONMENT:	0:01:26	0:01:14	0:03:05	(00:01:14)