



Waste to Energy A Path to (almost)Zero Waste to Landfill

Georgia Recycling Coalition Annual Conference
Jekyll Island, GA.
October 28, 2025

Our Story

We help our clients solve solid waste management issues by providing **innovative**, **responsible**, **sustainable**, and **economical** strategies and solutions for the benefit of communities and the environment.

GBB is an international solid waste management consulting firm that helps public- and private-sector organizations craft practical, customized and technically sound solutions for complex solid waste management challenges.

Since 1980, GBB has been a trusted resource at the forefront of the industry, creating success stories that integrate smart planning with effective management of solid waste services. Our staff enables our clients to do more with less.



ENVIRONMENT



SOCIAL



GOVERNANCE

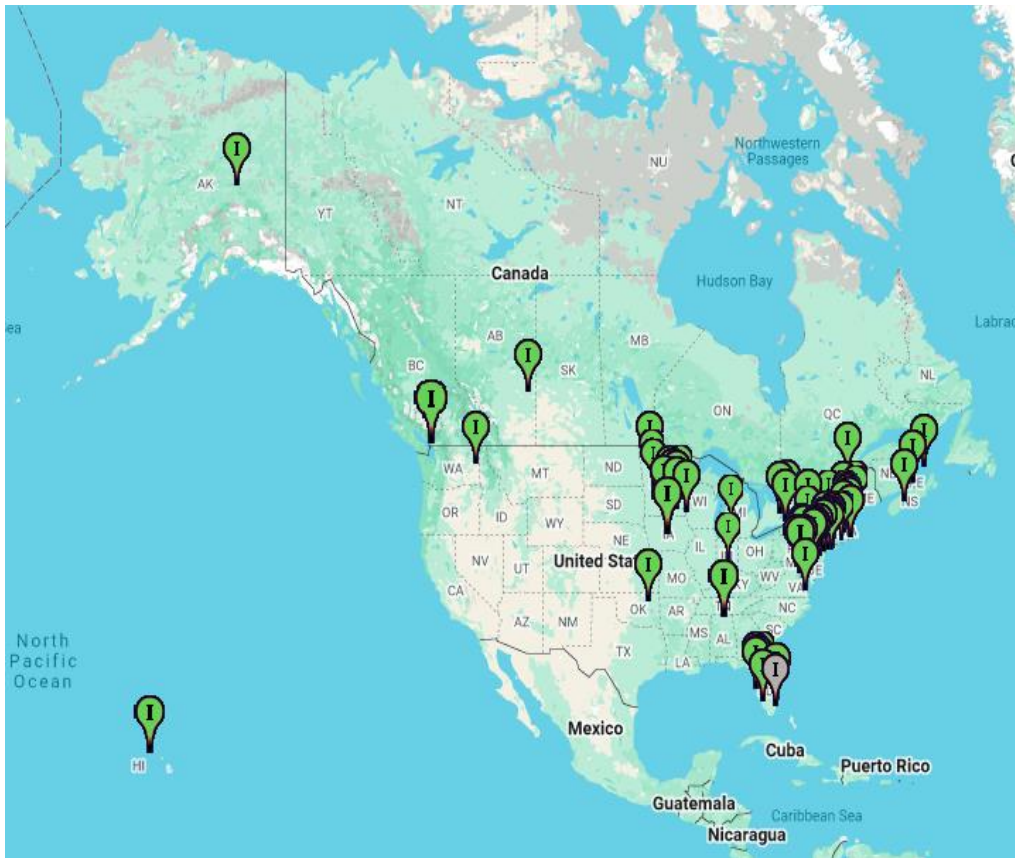


Our Comprehensive Services



Waste to Energy

US. and EU.



Waste-to-Energy in Europe in 2017

■ WtE Plants operating in Europe
(not including hazardous waste incineration plants) : **492**

■ Waste thermally treated in WtE plants
(in million tonnes): **96**

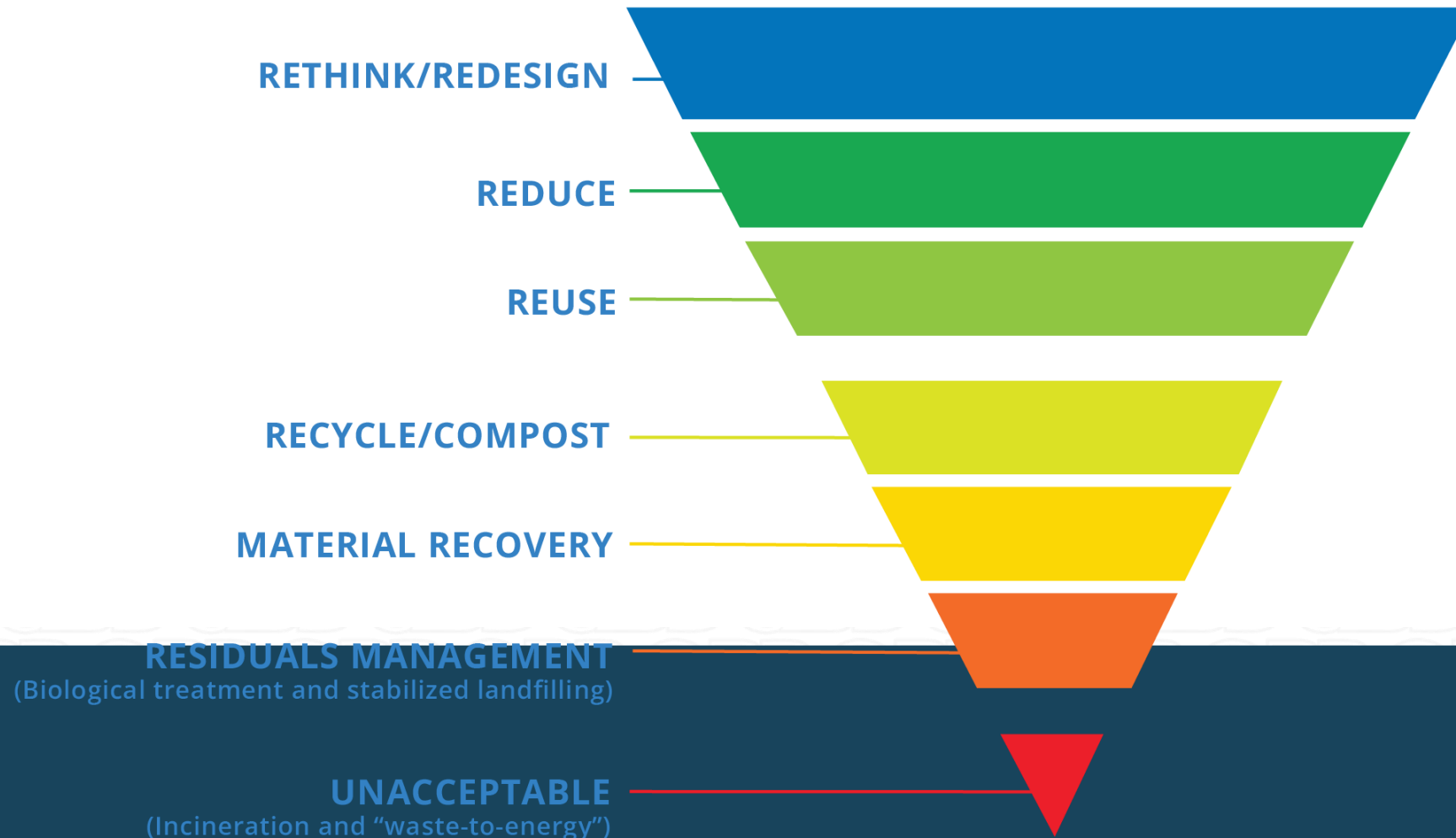
Data supplied by CEWEP members
and national sources

* Includes plant in Andorra and SAICA
plant

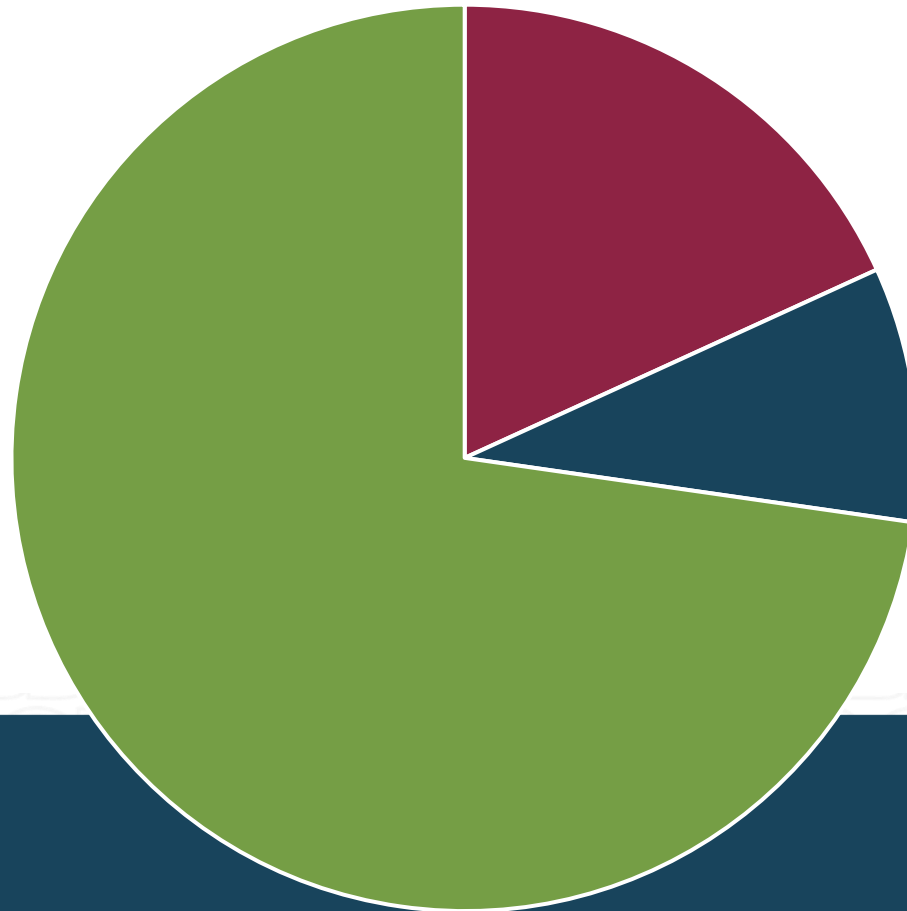


THE ZERO WASTE HIERARCHY 8.1

For detailed version visit www.zwia.org/zwh



'Waste' now



■ Recycled ■ Composted ■ Landfilled ■

'Waste' When...



■ Recycled ■ Composted ■ WtE ■

Does WtE work?

Yes. There are three different approaches.

Dedicated Boilers

- Honolulu, HI
- Palm Beach, FL



Mass Burn (most common)

- Baltimore, MD
- Minneapolis, MN
- Lancaster, PA
- Palm Beach, FL



Supplemental Fuel

- Cement kilns (2,700°F!)
- Industrial solid fuel boilers



Onondaga County Resource Recovery Authority

(OCRAA!)

Syracuse, NY

Reworld

OCRAA Dep. Executive Dir./

Environmental Engineer Mike Mokrzyki ->

Mass Burn WtE

- ~1,000 tpd
- Ash as Alternative Daily Cover (ADC)
- Powers 15% of County's homes - (30,000)
- \$100/ton service fee (net)
- Flow Control
- ~3 cents/KwH



Onondaga's Bottom Line

Our Facility's Annual Impact



Less waste in landfills reduce greenhouse gas emissions by **238,000 metric tons** of CO₂. That's like taking **51,000 passenger vehicles** off the road for one year.



We produce **39 megawatts** of electricity 24/7 with our Waste-to-Energy process - enough to power **21,000 homes** for a year.

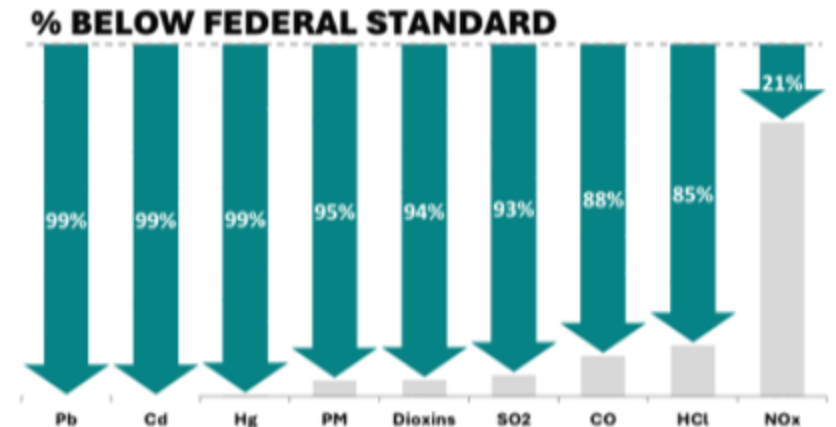


We also recover **12,800 tons** of metal for recycling annually - enough to build **10,000 cars**.

Environmental Compliance

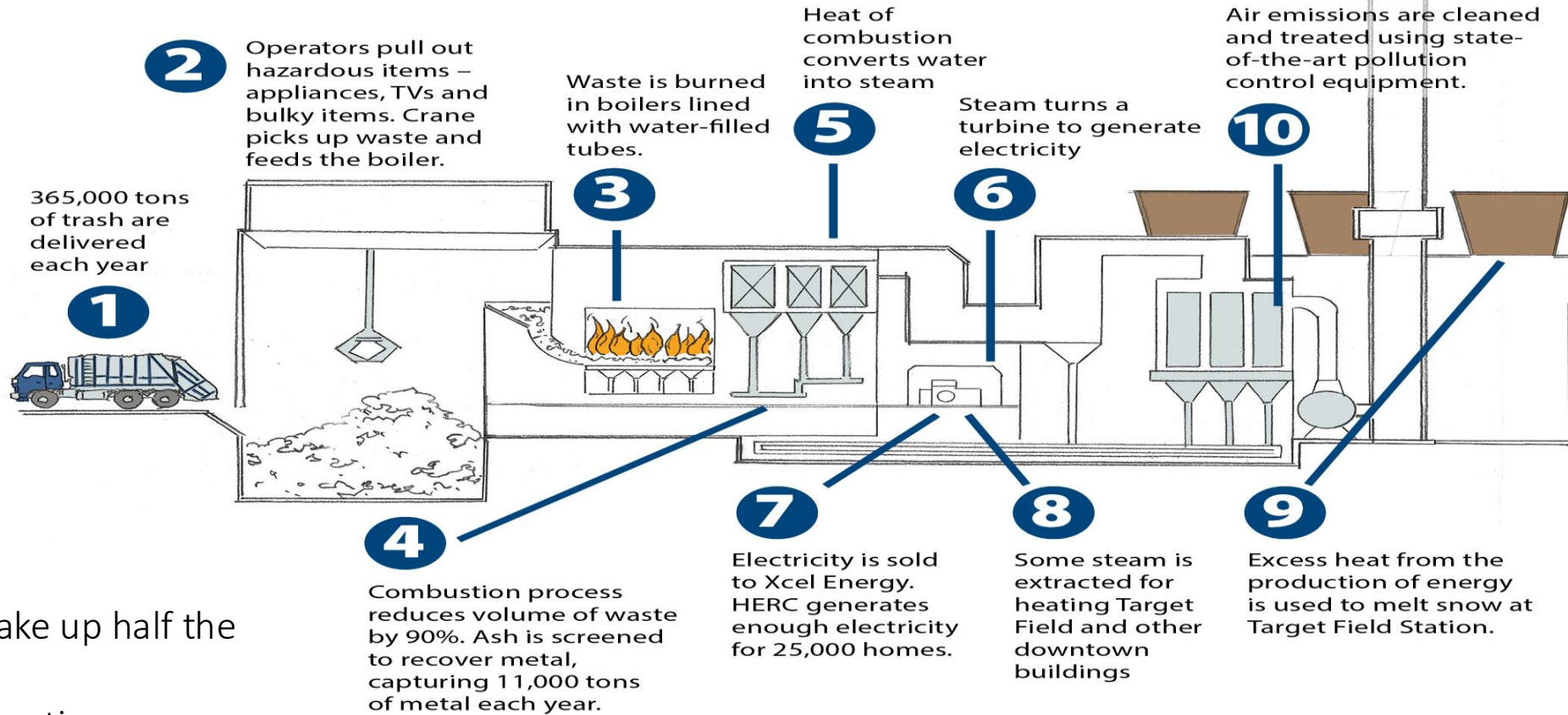
up to
99% below
Federal emissions
standards, based on
annual averages**

**100%
compliant**
with Continuous Emissions
Monitoring (CEMS) standards



Sources: <https://www.reworldwaste.com/where-we-are/facilities/Onondaga>; and https://4944195.fs1.hubspotusercontent-na1.net/hubfs/4944195/CSR%20Resources%20Page/Performance%20Sheets/2024/Facility_Performance_Onondaga_County_TTF_2024_Performance_Sheet.pdf.

How HERC works



- Controls make up half the system
- Results of continuous monitoring are posted online
- [Montgomery County MD](#)
- [Palm Beach FL](#)
- [OCRRA](#)

Best Burn $\neq$ Burn Everything

Goal – remove all recyclables

- Plastics and paper have high BTU value, but operators want a consistent blend of fuel
- Mixed waste processing is best pre-treatment before WtE and provides opportunity for more recyclables diverted
- Metal recovery after burn

Remove moisture

- Facility design has dryers

Remove hazards and headaches

- Batteries, cylinders, chemicals – anything that goes ‘boom’
- Bedding box springs
- Over-sized items

Remove Organics if possible

- 2020 GBB report for Red Wing, MN found fibers, food scraps and yard debris have limited BTU value; better to compost

Specific requirements, landfill vs. WtE

Landfill

- ~2,000 acres/1,000 tpd **can last ## years**
- Post-closure monitoring – 30 years
- Odor issues - require constant vigilance
- Lifespan limited by permitted airspace



Waste to Energy

- ~10 acres/1000 tpd
- Post-closure monitoring – N/A
- Odor issues – **minimal**
- ~50-year lifespan, with one major retrofit mid-life. (SWANA, June 2025)



Nutshell Economics

Landfill

- \$55.57/ton (national average for non-WtE states)
- Post-closure costs
- Revenue from:
 - Tipping Fees
 - Methane recovery post closure
 - Methane to Energy royalties

Waste to Energy

- \$71.28/ton (national average for WtE states)
- No post-closure costs
- Revenue from:
 - Tipping/Service Fees
 - Power and energy product sales (77.5% of market rate)
 - Recyclable metals

How does WtE control pollution?

Short answer: Like a car's catalytic converter. Not just burning hotter.



Longer answer: Chemistry

- Compounds bind with pollutants at a molecular level.
- Add ammonia to neutralize NO_x
- Inject activated carbon into flue gases to capture vaporized mercury
- Continuous monitoring of emissions, transparent reporting

Emissions: WtE vs. Landfilling

- All waste combusted, leaving 10% ash for ADT
- Pollution well below permit limits
- Zero emissions at end of life

- During operations, methane recovery incomplete
- Emissions (and monitoring) continue after closure

“...diverting MSW in the U.S. from a landfill to a TTF for treatment resulted in 3.9 MT CO₂e avoided per MWh when the essential service of waste management provided by TTF and avoided landfill methane is considered for the 20-year GWP.”

Source: 2024 lifecycle assessment study by ReWorld

WtE when

You need a Plan B for disposal. Not always the top choice, but worthy of consideration.

- Disposal contracts change
- Desire to really reach as little waste to landfills as possible
- Communities with energy needs
 - Demand for AI data centers
 - New manufacturing facilities

- No new MSW landfills
 - New England states
 - Long Island NY

- Landfill siting opposition

WtE $\neq$ Easy

- Lots of opposition – perception is reality
- Power revenue is under valued
- 10-year siting/permitting process is > length political terms
- Increased recycling and organics diversion getting more attention
- Landfilling option generally continues to be lower cost solution

FINAL THOUGHT

Recycling and organics diversion should first be maximized and even when that is accomplished, there will be significant materials left to deal with. And those materials will have significant energy content and some recoverable recyclables as well. There are two choices at this point: landfill those materials or WtE.

OCRRA process (video)

Questions & Answers

Thank You!



Joe Dunlop

GBB Project Manager

(703) 559-1114

jdunlop@gbbinc.com