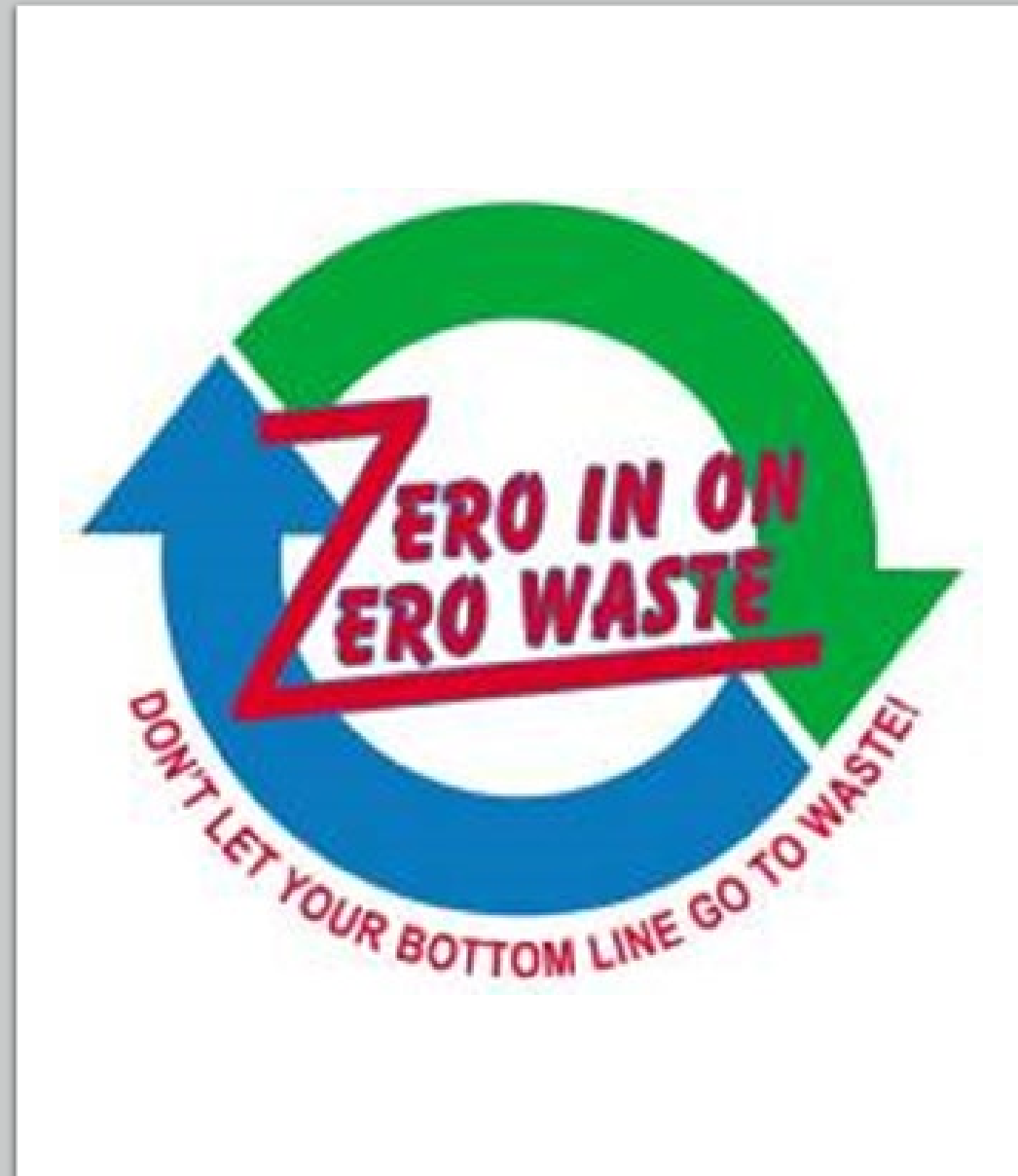


# Introduction to Zero Waste

Presentation to Toxics Use  
Reduction Institute  
Solid Waste Workshop

April 27, 2022

by Gary Liss



Zero Waste =

**REDUCE**  
**REUSE**  
**RECYCLE**



**Focusing first on reducing and reusing,  
then recycling, composting and redesigning the rest**

# International Zero Waste Definition

Zero Waste is the **conservation of all resources** by means of responsible production and consumption, reuse and recovery of products, packaging and materials **without burning** and with **no discharges to land, water, or air** that threaten the environment or human health.



[www.zwia.org](http://www.zwia.org)

Zero Waste Means:  
Not Burn or Bury





# No Discharges to Land, Water or Air



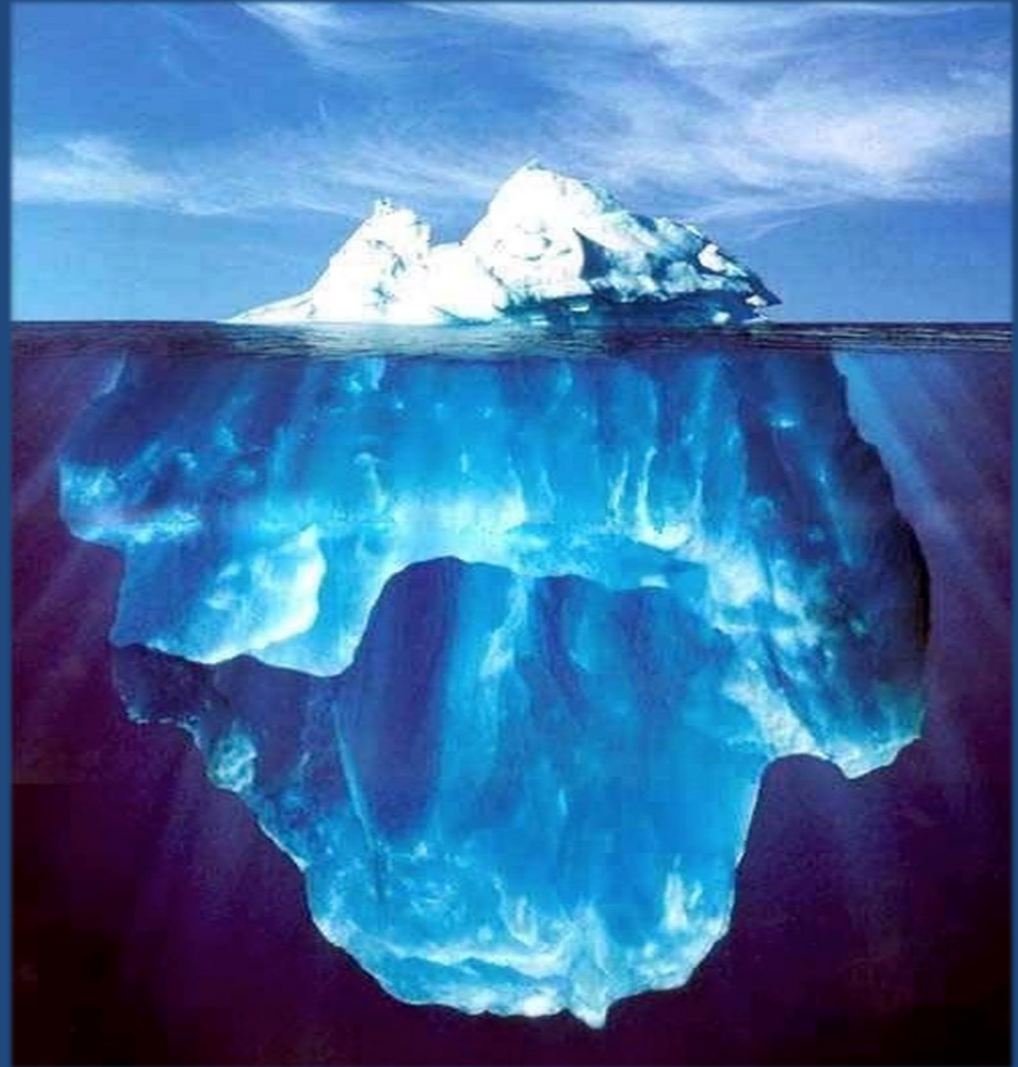
# Zero Waste & Climate Change

- Landfills are one of the largest sources of Greenhouse Gases (GHG)
- Methane is 25-72x more potent than CO<sub>2</sub>
- Recycling & composting all discards in CA = eliminating all auto exhaust in CA



# Wasteberg

71 Tons “Upstream”  
For Every Ton MSW



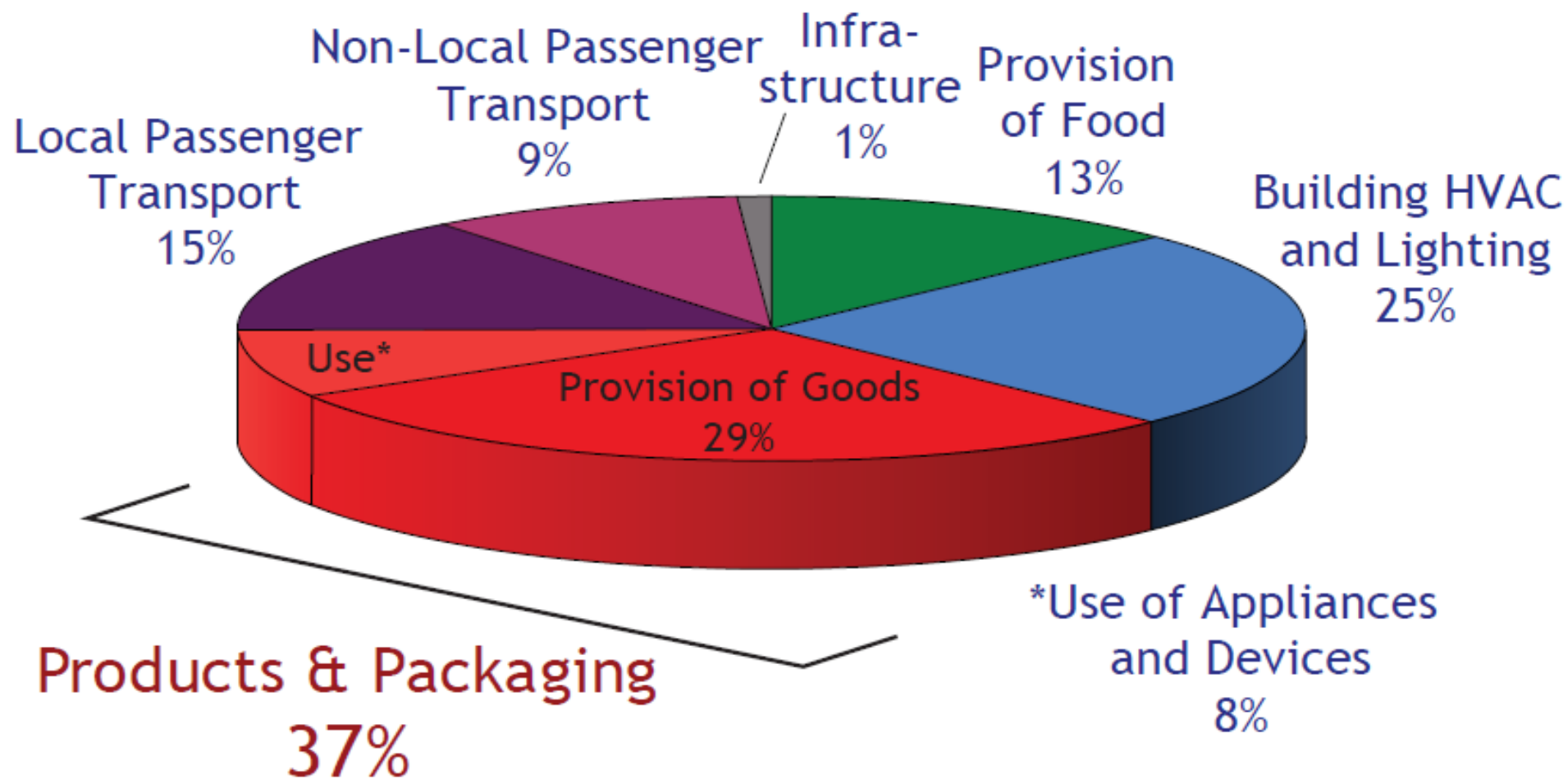
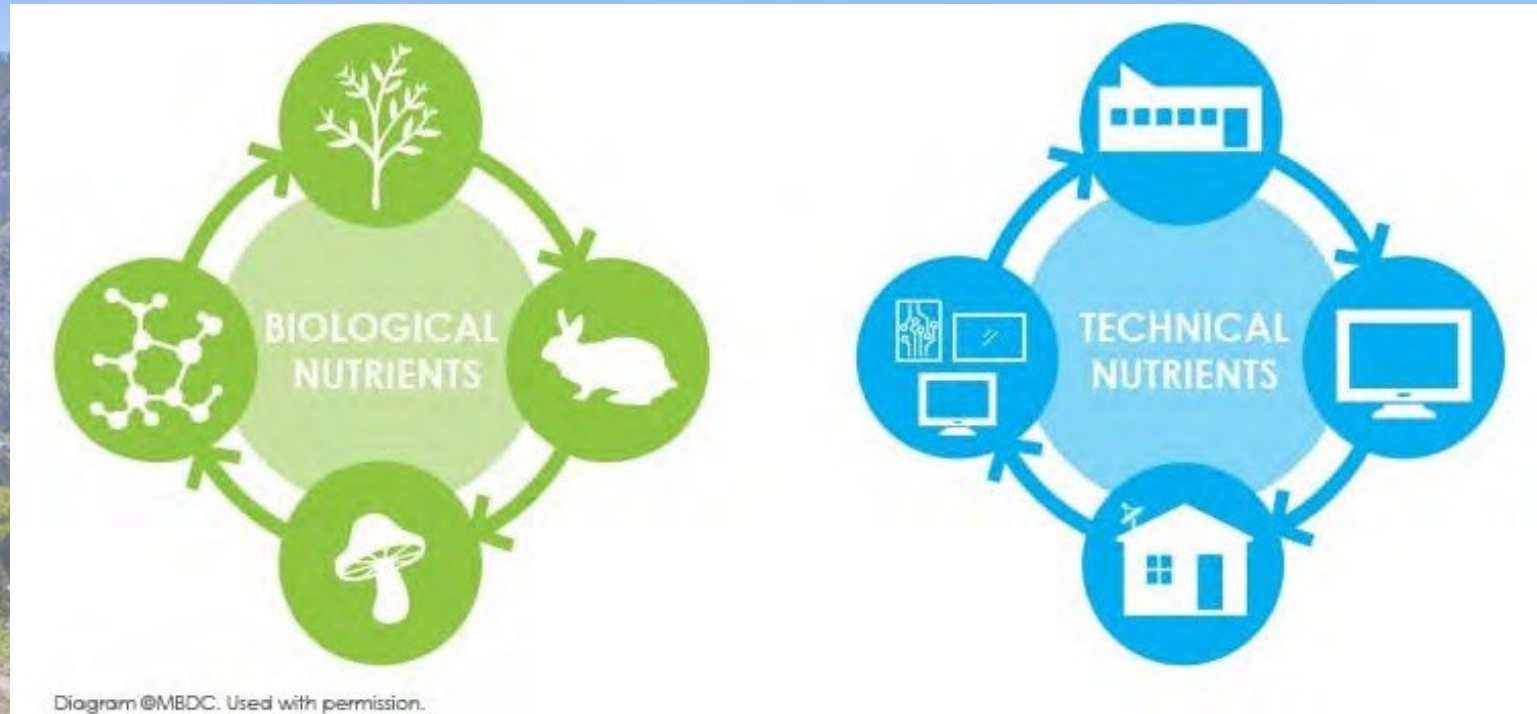


Figure 1: U.S. Greenhouse Gas Emissions: Systems-based view.  
 Source: U.S. EPA, 2009.

*(Provision of Goods: all consumer goods including building components and vehicles.)*



# Zero Waste is Key to a Circular Economy





# ZW Reduces Impacts to Fenceline Communities, Supports Just Economy & Environmental Justice

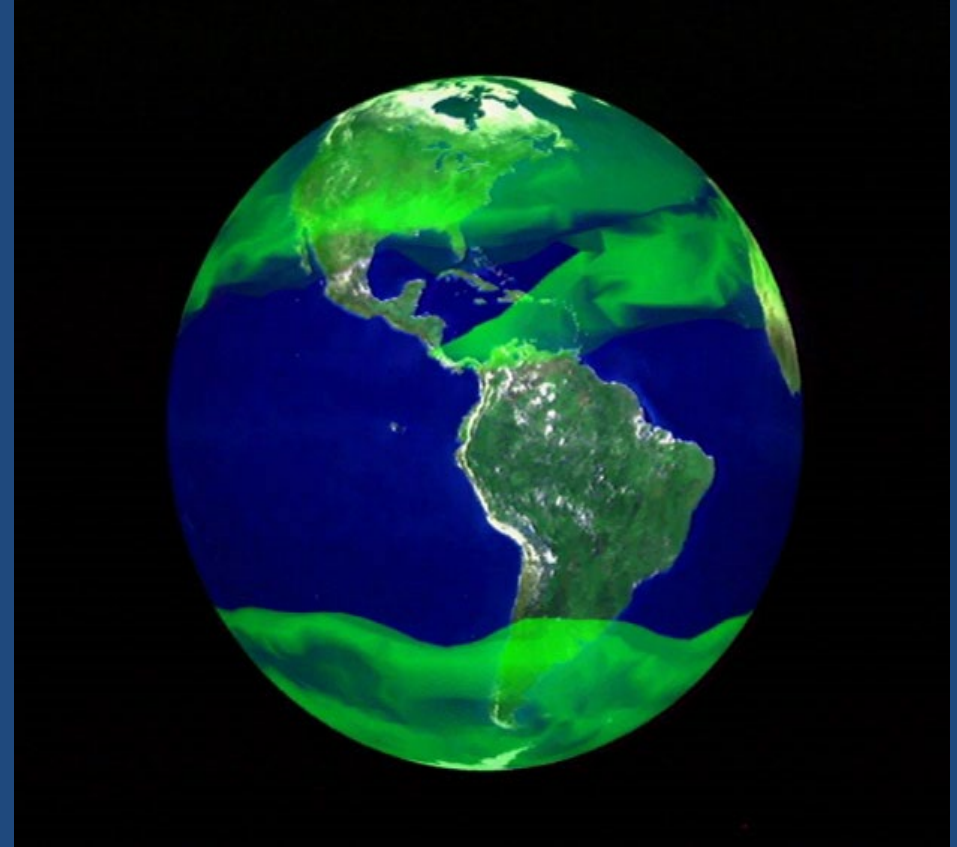


A Fenceline Community is an area that contains all or part of a low-income community or community of color and that demonstrates an increased health risk to its residents due to its proximity to a major source of pollution.



# Is Zero Waste Attainable ?

- Nature Is The Model
- Zero Waste, Or Darn Close
- Businesses Have  
Achieved Over 90%  
Waste Reduction



Picture: Methane Earth; Credi: GISS, NASA t



# Businesses are Leading the Way to Zero Waste (>90% diversion)

- Anheuser-Busch, several
- Albertson's (100 stores)
- American Licorice\*
- Ann, Inc.\*
- Delaware North, Yellowstone\*
- Del Mar Fairgrounds
- Disneyland Circle D Corral\*
- Earth Friendly Products\*
- Fetzer Vineyards\*
- Frankie's Bohemian Café, SF
- General Motors (117 plants)
- Hilton Hotel, SF
- Honda
- Microsoft\*
- Miller/Coors
- New Belgium Brewery\*
- Nutiva\*
- Piazza Produce\*
- Pillsbury
- Scoma's Restaurant, SF
- Sierra Nevada Brewing Co.\*
- Subaru
- Toyota
- Vons-Safeway
- Whole Foods Markets\*
- Xerox Corp
- 2800 Businesses in Japan

**\*Certified by TRUE Zero Waste – more examples at [TRUE.GBCI.org](http://TRUE.GBCI.org)**



# Zero Waste Drivers/Benefits to Businesses

- Saves money
- Reduces liability
- Increases efficiency
- Reduces greenhouse gas emissions
- Marketing edge
- Clean energy/saves energy
- “Right thing to do”



# Zero Waste Business Principles

Commitment to the **triple bottom line**

Use **precautionary principle\***

**Zero Waste** to landfill or incineration

**Buy reused**, recycled, and composted

**Responsibility:** take back products/packaging



*\* Precautionary Principle: if some course of action carries even a remote chance of irreparable damage to the ecology, then you shouldn't do it, no matter how great the possible advantages of the action may be.*



# Zero Waste Business Principles


Prevent **pollution** and reduce waste

**Highest and best use**

Use **economic incentives** for customers, workers, and suppliers

Products or services sold are **not wasted or toxic**

Use **non-toxic production**, reuse, and recycling processes



**non-toxic**



# GBCI TRUE Zero Waste Rating System

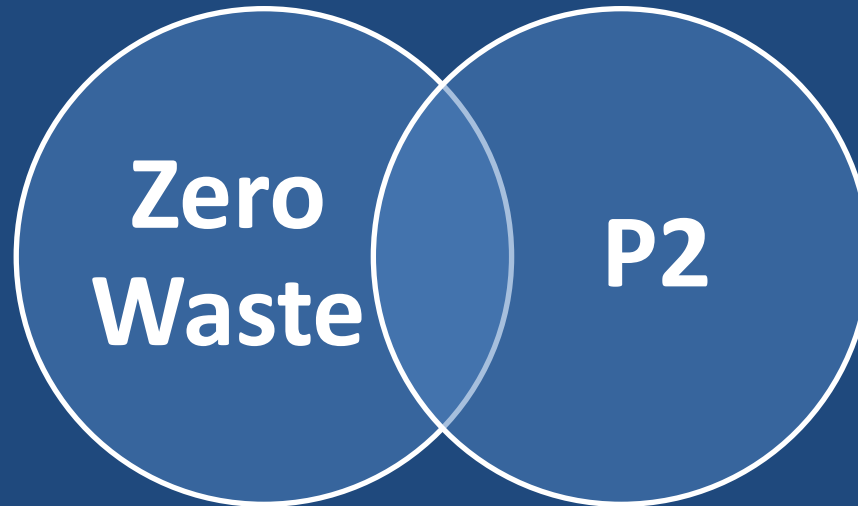
Facility Totals (Pre Certification Estimates)			Points
Bronze: 31-37 points Silver:38-45 points Gold: 46-63 points Platinum 64-81 points			81
Overview of Categories & Points			
Redesign	4	Leadership	6
Reduce	7	Training	8
Reuse	7	ZW Analysis	5
Compost (Re-earth)	7	Upstream Management	4
Recycle	3	Hazardous Waste Prevention	5
ZW Reporting	4	Closed Loop System	4
Diversion (Min 90%)	5	Innovation	3
ZW Purchasing	9	Total Points	81



# Overview of Zero Waste Connections with P2

➤ Focus on Non-Hazardous Solid Waste

➤ Focus on Toxics & Hazardous Solid Waste

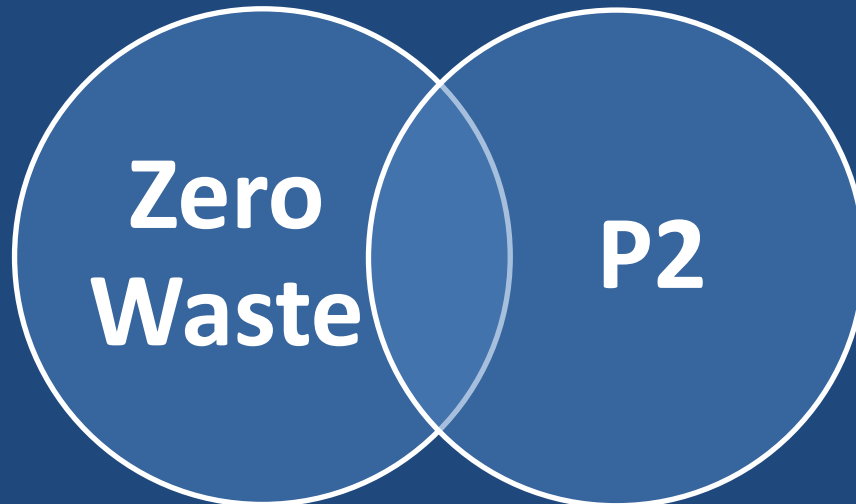


➤ Crush and grind materials

➤ Apply Engineering, Biology, Chemistry, Physics, and Natural Principles

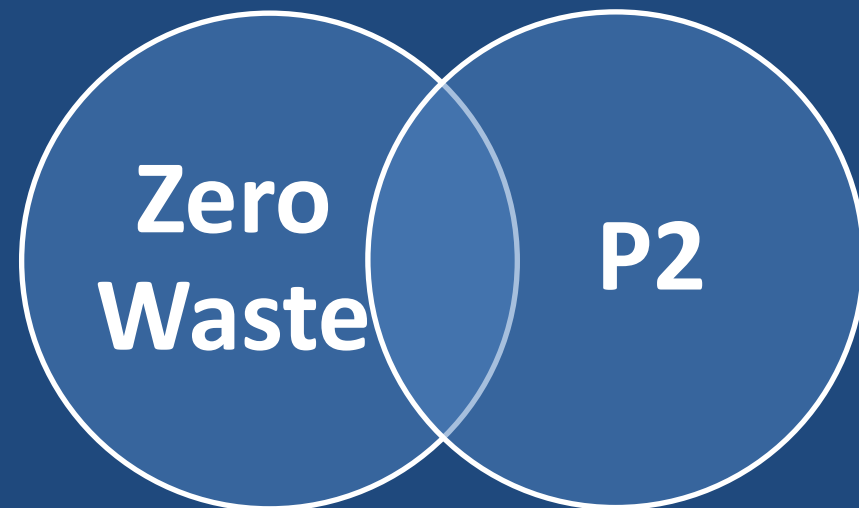
# How P2 can Help with Zero Waste

- Redesigning Products and Processes
- Uses for Hard to Recycle
- Research & Development
- Technical Assistance to Biz
- Alternatives to Toxics



# How ZW can Help with P2

- Identifying Products Needing Redesign
- Identifying Hard to Recycle & Toxic Materials
- Set up Research & Development Programs
- Identify Biz Needing Technical Assistance
- Recognition & Certification
- Training



# Zero Waste Planning

- Review Purchasing Records
- Summarize Existing System from Zero Waste Audit
- ID Service Opportunities
- Evaluate Policies, Programs and Infrastructure needed
- Economics and Funding
- Recommendations (including Diversion Tracking System)
- Implementation Timeline



**PREPARED FOR:**

Sandia National Laboratories, Albuquerque, New Mexico



# Stakeholder Engagement

- Total Employee Involvement
  - Every Department: Facilities, Food Services, Grounds, Human Resources, Purchasing, Accounting, IT, Fleet,
- Contractors and Suppliers
- Technical and Cultural Change
- Continual Improvement - Kaizen
- Celebrate



# Zero Waste Business Stakeholders

## Upstream

- Vendors
- Suppliers
- Designers
- Marketing

## Downstream

- Waste Hauler
- Recycler
- Broker/Processor
- Composter/Farmer

## Operations

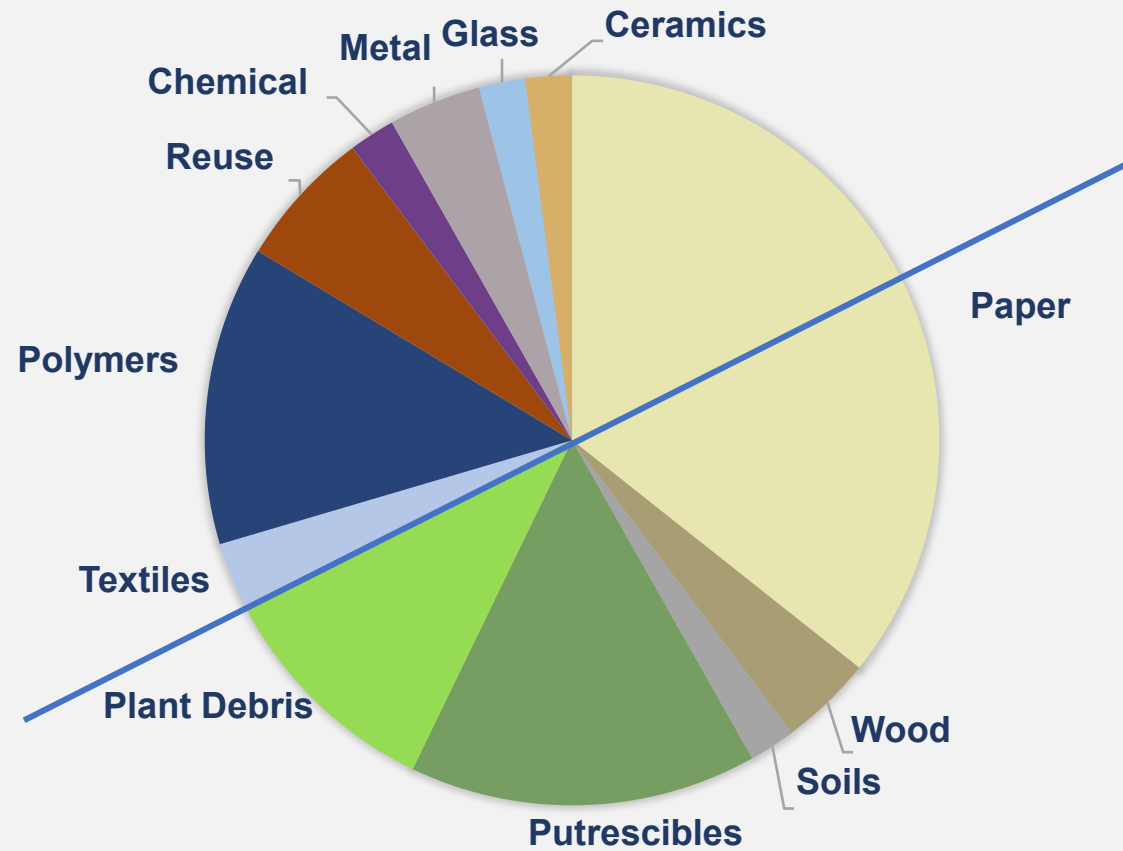
- Food Service Providers
- Janitorial
- Property Management

## Community

- Food Banks
- Government
- Nonprofits
- Customer
- Schools



# Know Your Discards – 12 Categories

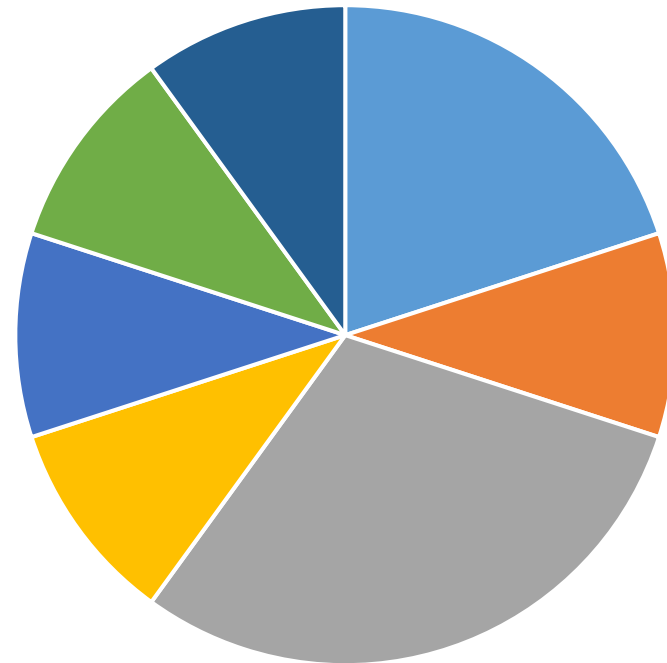


# Obtain Baseline Data

- 1. Audits/Characterization Studies**
  - a. Reusables**
  - b. Recyclables**
  - c. Compostables**
  - d. Discards/Residues**
  
- 2. Site Visits / Flip Lids**
  
- 3. Comparable Data**
  - a. From other comparable businesses or institutions**

# Know Your Sources

- 1. Warehousing & Distribution**
- 2. Offices**
- 3. Food Services**
- 4. Grounds**
- 5. Construction**
- 6. Manufacturing**
- 7. Vehicular Maintenance**
- 8. Retail**
- 9. Housing & Hospitality**



# Know Your Values (Fort Collins Commodity Analysis)

Categories	%	Annual Tons	\$/ton	Annual Revenues Lost (\$)
1. Reuse	4	5,600	\$400	2,240,000
2. Textiles	6	8,300	\$80	664,000
3. Polymers	14	19,500	\$100	1,950,000
4. Metals	4	5,600	\$80	448,000
5. Glass	2	2,800	\$20	556,000
6. Paper	25	34,800	\$20	696,000
7. Putrescibles	14	19,500	\$7	136,500
8. Plant Debris	16	22,200	\$7	155,400
9. Wood	5	7,000	\$8	56,000
10. Soils	3	4,200	\$7	29,400
11. Ceramics	6	8,300	\$4	33,200
12. Chemicals	>1	1,400	\$1	1,400
	<b>100</b>	<b>139,100</b>		

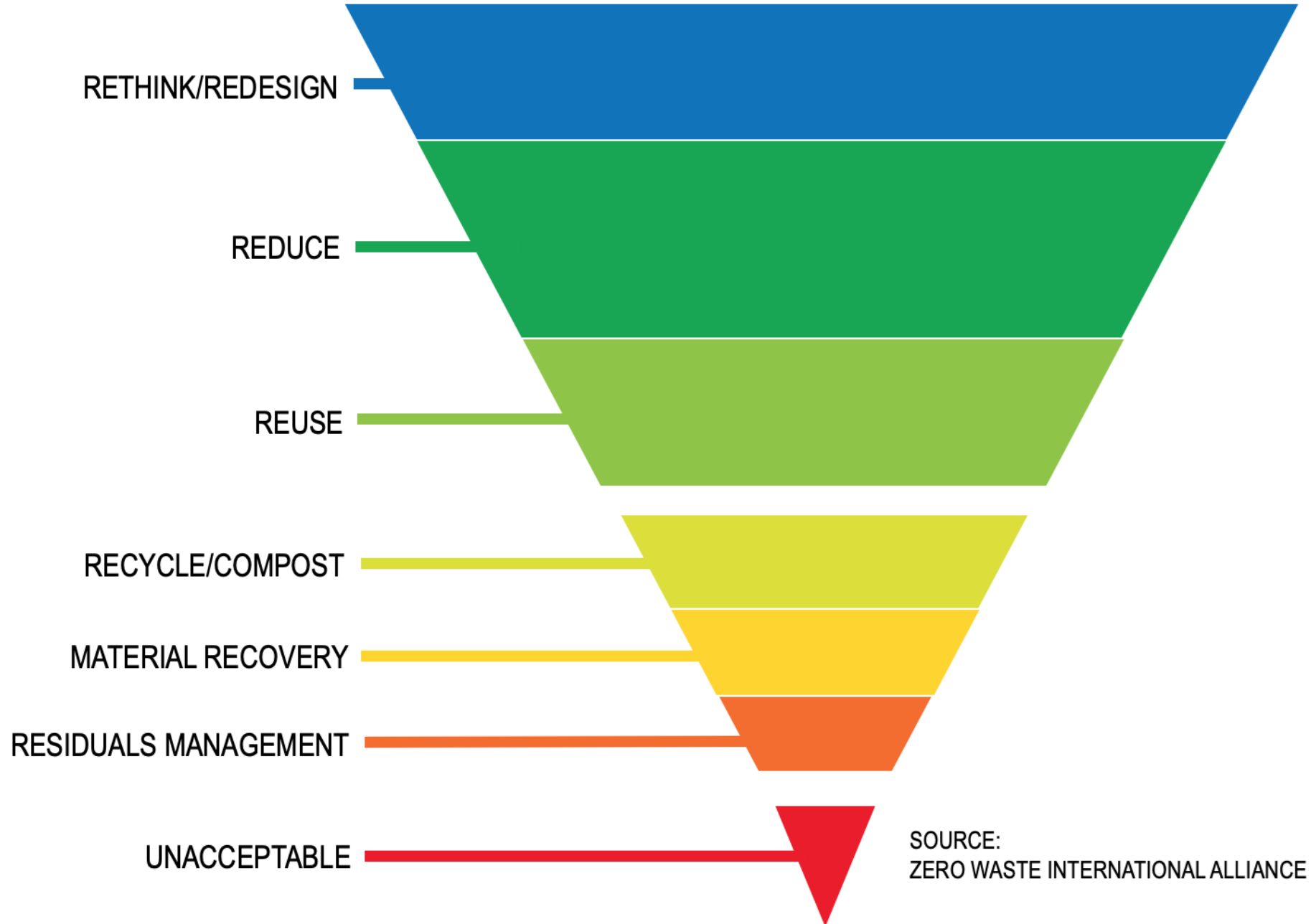


# Know your Policies & Programs

- Contracts - Collection, Processing, Disposal
- Container Sizes, Frequency, Rates
- Company Sustainability, Climate Change, Waste Policies
- Employee Information
  - Website, Handouts

# ZERO WASTE HIERARCHY OF HIGHEST AND BEST USE

For detailed version visit [www.zwia.org/zwh](http://www.zwia.org/zwh)



# Reduce First!

- Design out Wasting
- Wasting is not Inevitable
- Businesses save the most by eliminating inefficient practices
- Refuse and Return
- Takebacks

# Training & Leadership

- Adopt Zero Waste policy and provide to all employees
- Communicate regularly with staff about Zero Waste and recognize achievements
- Post Zero Waste info on internal website
- Include Zero Waste in employee evaluations, bonuses or other incentives
- Train purchasing agents on Zero Waste preferences
- Designate someone responsible for Zero Waste

The image shows a computer monitor displaying a 'KPI SNAPSHOT' report. The report is organized into a table with columns for 'Jan 2013', '2013', '2013 Plan', 'YTD 2013 Plan', 'YTD 2013', '2013', and '2009'. The rows list various performance indicators such as 'Revenue', 'Profit', 'Customer Satisfaction', and 'Employee Turnover'. The data is color-coded, with green indicating positive performance and red indicating areas needing attention. The report also includes a 'Variance' column and a 'Target' column.

	Jan 2013	2013	2013 Plan	YTD 2013 Plan	YTD 2013	2013	2009
Revenue	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000
Profit	200,000	200,000	200,000	200,000	200,000	200,000	200,000
Customer Satisfaction	85%	85%	85%	85%	85%	85%	85%
Employee Turnover	10%	10%	10%	10%	10%	10%	10%

# Training & Leadership

- Upper mgt. review monthly diversion activities
- Take responsibility for all products & packaging
- Require Suppliers to take responsibility for their products & packaging
- Promote Zero Waste in the community



# Set Zero Waste Goal & Date

- In Climate Change, Sustainability or Zero Waste Plan
- Higher waste diversion goal than current based on actual impacts expected from new policies, programs and infrastructure
- Set realistic milestones



# Right Sizing

- Businesses pay for collection each time the bin is serviced
- Un-flattened cardboard boxes and bags of air, waste bin space
- It costs to dispose of recyclables in the trash
- Knowing what goes in the bin is the first step in keeping it out
- Most businesses over subscribe for trash service
- Container Sizes, Frequency, Rates

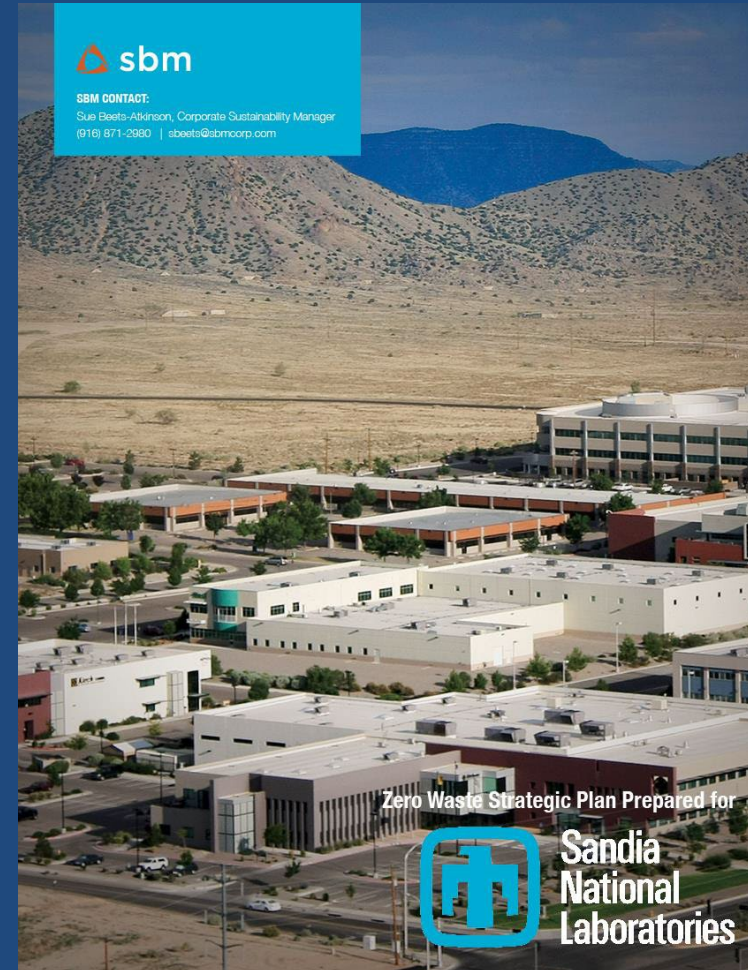
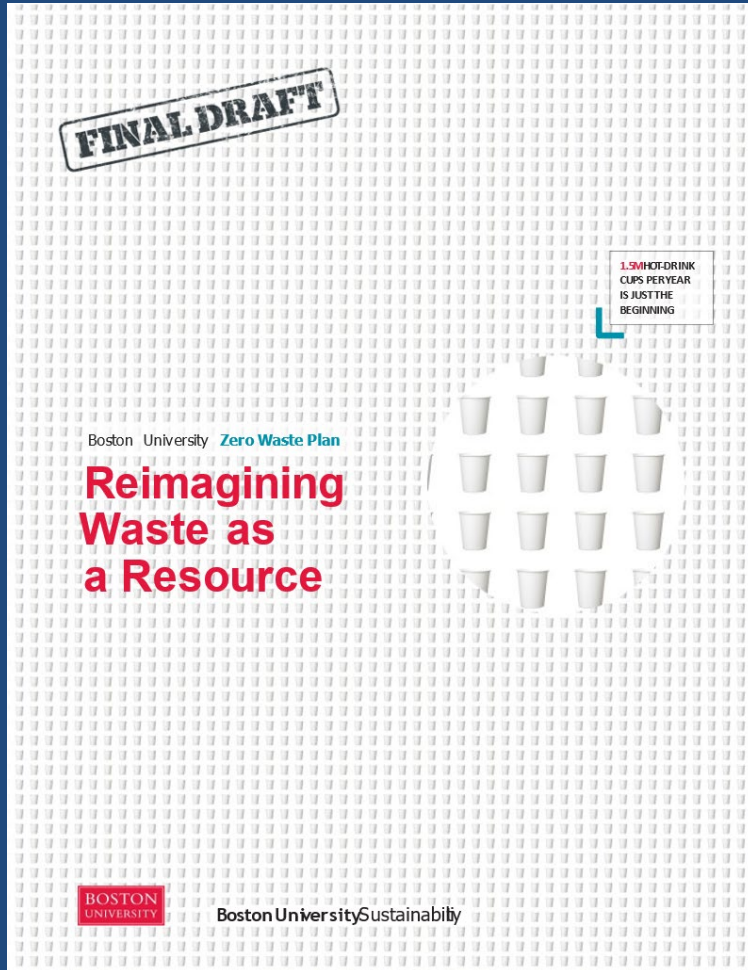


# Economic & Jobs Analysis





# Sample Zero Waste Plans



# The Zero Waste Economy

## Designing a Full-Cycle System—Upstream AND Downstream







United States Department of Agriculture

## The Office of Urban Agriculture and Innovative Production

---

- Created by the 2018 Farm Bill to encourage and promote urban, indoor, and other emerging agricultural practices including:
  - Community gardens and farms
  - Rooftop farms, outdoor vertical production,<sup>37</sup> and green walls, indoor farms, greenhouses, and high-tech vertical technology farms
  - Hydroponic, aeroponic and aquaponic farm facilities
  - Other innovations





United States Department of Agriculture

## Eligibility for USDA Funding

---

- City or township governments
- County governments
- Special district governments
- Municipal Governments
- Independent School Districts
- State-designated Indian Tribes
- Native American tribal governments (Federally recognized)
- Native American tribal organizations (other than Federally-recognized tribal governments – includes State-designated Indian tribes)





United States Department of Agriculture

## Pilot Projects

- Cooperative agreements;
- \$10.25 million available in FY2022
- Awards from \$45,000 to \$2 million
- Assists local and municipal governments plan and implement activities that:
  - Generate compost
  - Improve soil quality
  - Increase rainwater absorption
  - Reduce municipal food waste
  - Divert food waste from landfills
  - Increase access to compost for agricultural producers
  - Reduce reliance on, and limit the use of, fertilizer
  - Encourage development of waste management and permaculture business



## U.S. Environmental Protection Agency Infrastructure Funding

- RFAs to be issued later in 2022 and 2023
- Solid Waste Infrastructure for Recycling (SWIFR)
  - \$275 million (\$55 MM/year for 5 years, FY22-26)
  - Post-Consumer Materials Management Infrastructure Grants
  - Eligibility: State, tribes DC, territories and political subdivisions
- Reduce, Reuse, Recycling Education and Outreach
  - \$75 million (\$15 MM/year for 5 years)
  - Eligibility: State, local, tribal governments, NGOs and public-private partnerships
- <https://www.epa.gov/recyclingstrategy/forms/stay-connected>



# U.S. Environmental Protection Agency Pollution Prevention Funding

- Were Due 4/11/22
- Eligibility: states, tribes, universities or partners in business, local governments or non-profit organizations
- Request for Applications (RFA) with Recurring Funding (Due 4/11/22)
  - \$9.38 million (\$4.69 MM/year)
  - 50% Cost Share/Match (\$20K - \$400K/yr.)
  - Post-Consumer Materials Management Infrastructure Grants
- Request for Applications (RFA) with BiPartisan Infrastructure Law Funding
  - \$13.9 million
  - 0% Cost Share/Match (\$20K - \$350K/yr.)



# Zero Waste Resources

- Zero Waste USA: [zerowasteusa.org](http://zerowasteusa.org)
- Zero Waste International Alliance: [zwia.org](http://zwia.org)
- U.S. Green Building Council TRUE: [TRUE.gbci.org](http://TRUE.gbci.org)
- National Zero Waste Conference: [zwconference.org](http://zwconference.org)



A sunset over a body of water with silhouetted hills and trees. The sun is low on the horizon, creating a bright orange glow that reflects on the water. The sky is a mix of orange and dark blue. The foreground shows dark silhouettes of trees and hills.

If you're not for Zero Waste,  
how much waste are you for?

Gary Liss  
916-652-7850  
gary@garyliss.com  
www.garyliss.com