

Zero Waste for Business



Zero Waste USA

*Inspiring Communities to Embrace
and Achieve Zero Waste*

Introductions

1. Name
2. Organization
3. Title / Role

Agenda

1. Welcome & Introductions
2. What is Zero Waste?
3. Zero Waste Drivers & Benefits
4. Elements of a Zero Waste System
5. Educating & Motivating
6. Zero Waste Planning
7. Right Sizing
8. Zero Waste Purchasing
9. Zero Waste Resources
10. Class Project – ZW Plan for a Business

What is Zero Waste?



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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 a goal that is ethical, economical, efficient and visionary, to guide people in changing their lifestyles and practices to emulate sustainable natural cycles, where **all discarded materials are designed to become resources for others to use.**

Zero Waste means designing and managing products and processes to systematically avoid and eliminate the volume and toxicity of waste and materials, conserve and recover all resources, and **not burn or bury them**

Implementing Zero Waste will **eliminate all discharges to land, water or air** that are a threat to planetary, human, animal or plant health.

Zero Waste Means: No Burn or Bury

(Not Zero to Landfill)



No Discharges to Land, Water Or Air



No “Away”



Nature is the Model



Zero Waste Or Darn Close

90%

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

- Anheuser-Busch, several
- Albertson's (100 in So. CA)
- American Licorice*
- Ann, Inc.*
- Delaware North, Yellowstone Pk.*
- 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, SoCA*
- Xerox Corp
- 2800 Businesses in Japan

***Certified by GBCI**

More examples at [TRUE.GBCI.org/projects](https://www.truegbc.org/projects)

Vons Safeway

Less Fortunate Fruits & Vegetables...



...are shrink wrapped
and backhauled to
Central Distribution



4th Largest Collegiate Stadium

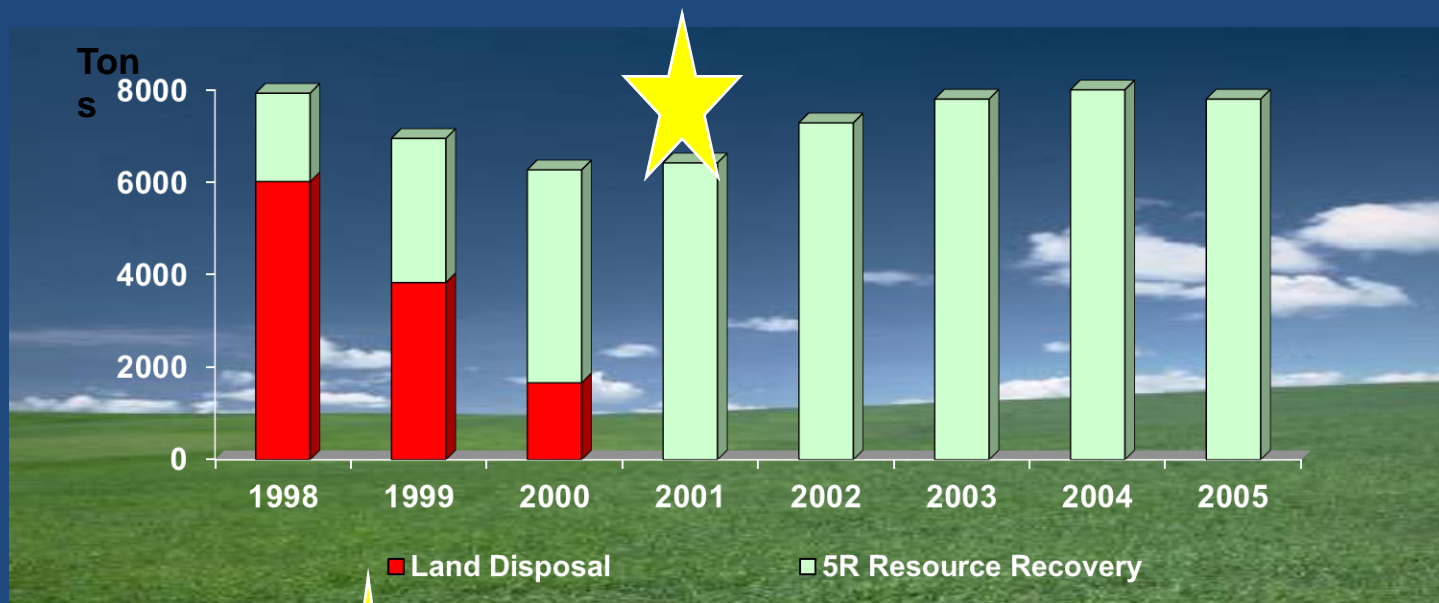
Last Game of 2012: 98.2%

Diversion Rate

2012 Season: 87% Diversion Rate

ZERO WASTE AT OHIO STADIUM Achieving Zero Waste
Corey Hawkey, Sustainability Coordinator, The Ohio State University

Ricoh Zero-Waste-to-Landfill Achieved Feb. 2001



100% Resource Recovery

Zero Waste Production



REFUSE

- Avoid buying unnecessary waste



RETURN

- Return packaging materials to suppliers



REDUCE

- Reduce waste at the source



REUSE

- Re-use everything possible



RECYCLE

- Recycle any remaining waste streams

The Ricoh Group's 5Rs

5R – Reduce Activity

Supported by our Suppliers & Customers

Packaging Optimization- Joint Effort

Chemical came in
many small cans...



...now in drums

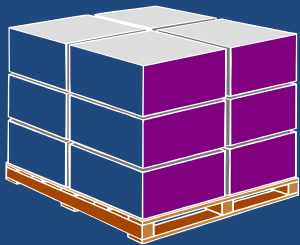


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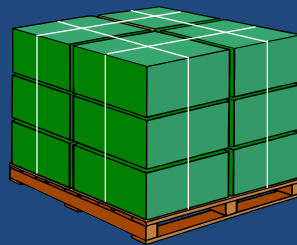
Reduction of:

- Labor time for switching cans and cleaning leftover chemicals
- Water usage
- Packaging material cost

6 individual cases were
put into a master carton...



...no more
master carton



=

Reduction of:

- Packaging cost
- Packaging time
- Freight cost



REDUCE

Reduce Unnecessary Packaging Material

5R – Recycle Activity Supported by Our Supplier



RECYCLE

Optimized Packaging Style & Recycle waste

Before

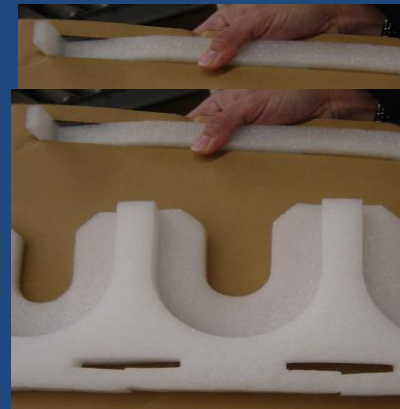


After



Results

1. No glue to buy and store
2. No drying time



1. Much easier to separate Styrofoam from liner
2. No more use of a knife to cut the glued joint

Zero Waste Communities (adopted Goal)

- 200+ cities in Italy
- Over 66% of New Zealand cities & entire country
- Toronto, Ontario
- Buenos Aires, Argentina
- Seattle, WA
- Chicago, IL
- Washington, DC
- New York, NY
- Boston, MA
- Philadelphia, PA
- 30+ cities in California (incl. all largest)
- Austin, Dallas, San Antonio and Denton, TX
- Telluride, Boulder City & County, and Fort Collins, CO
- Centre County Recycling & Refuse Authority, PA
- Logan County, OH
- Central Vermont Waste Management District
- Halifax, Nova Scotia

Zero Waste Drivers & Benefits



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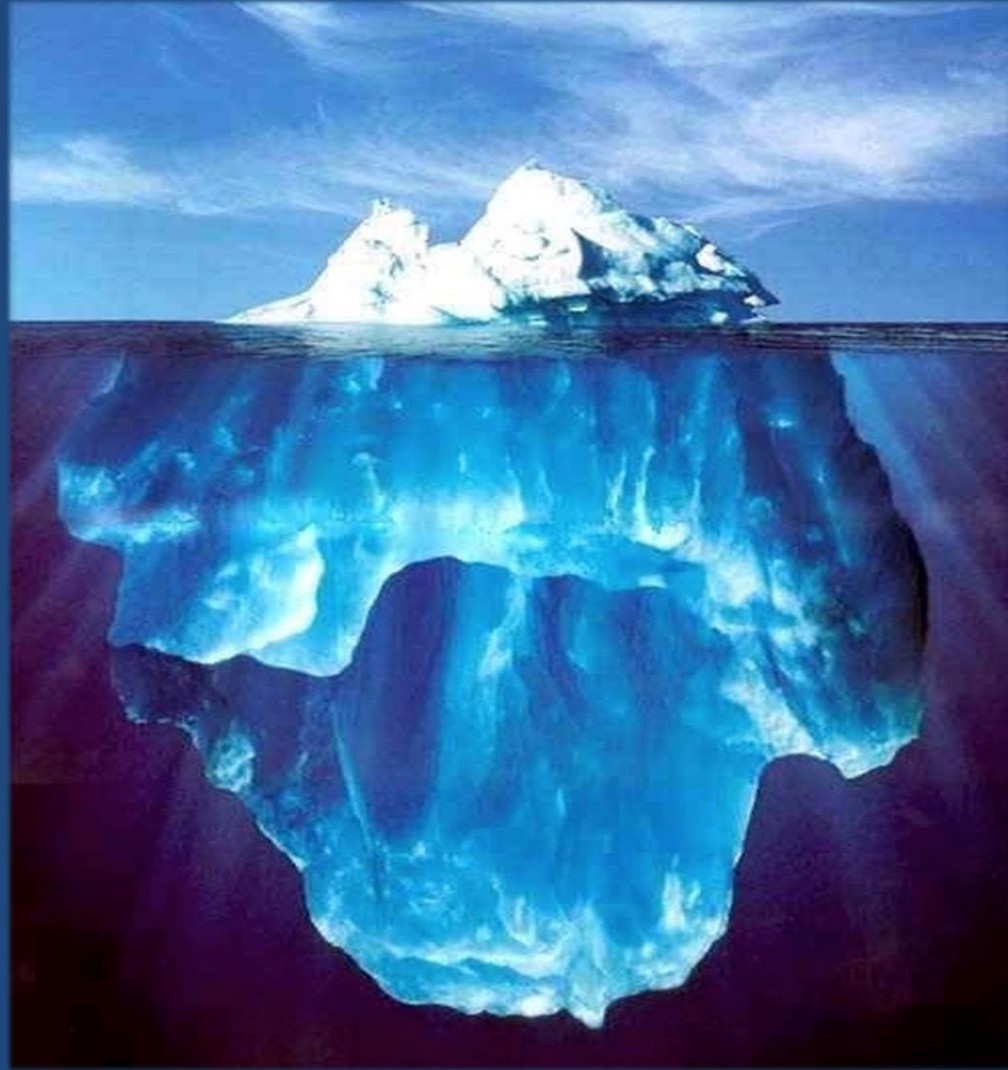
Zero Waste & Climate Change

- Landfills are one of the largest sources of Greenhouse Gases (GHG)
- Methane is 21-72x more potent than CO₂
- Recycling & composting all discards in CA
= eliminating all auto exhaust in CA



Wasteberg

71 Tons “Upstream”
For Every Ton MSW



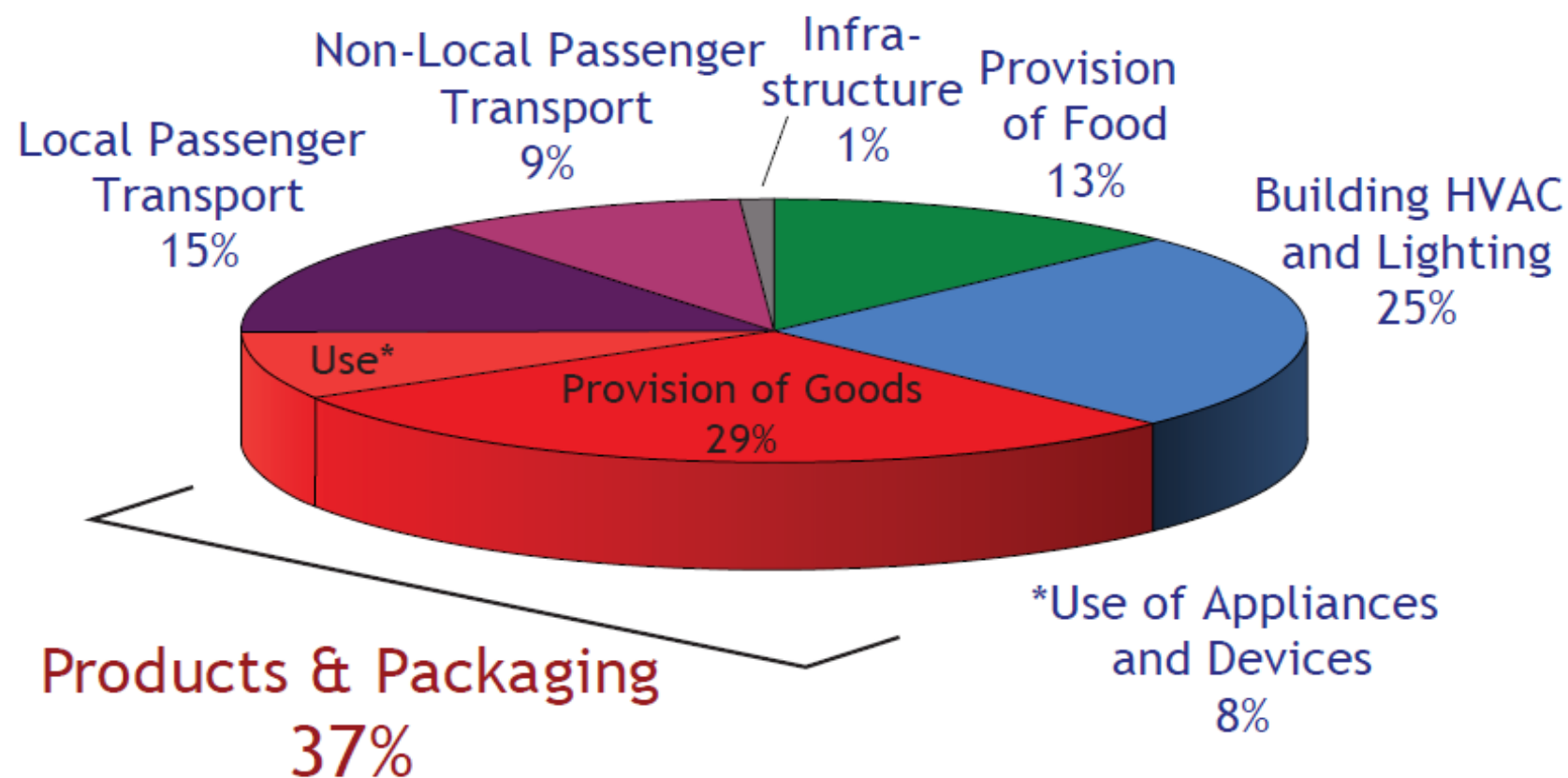


Figure 1: U.S. Greenhouse Gas Emissions: Systems-based view.
Source: U.S. EPA, 2009.

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

Zero Waste Drivers/Benefits to Businesses

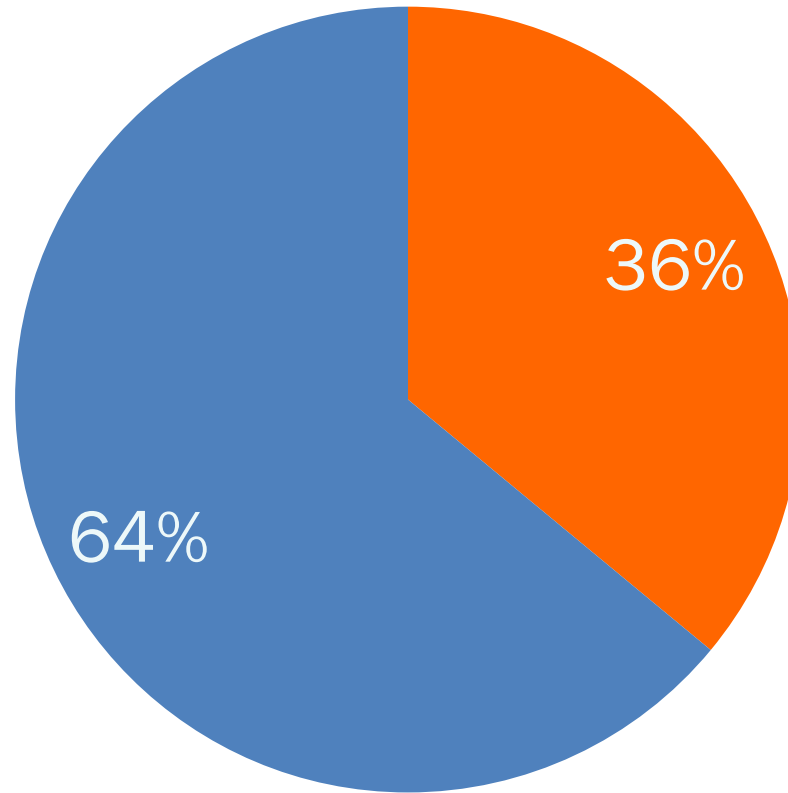
- Saves money
- Reduces liability
- Increases efficiency
- Reduces greenhouse gas emissions
- Marketing edge
- Clean energy/saves energy
- “Right thing to do”



FETZER
PIONEERS IN SUSTAINABILITY



Zero Waste is all about Efficiency



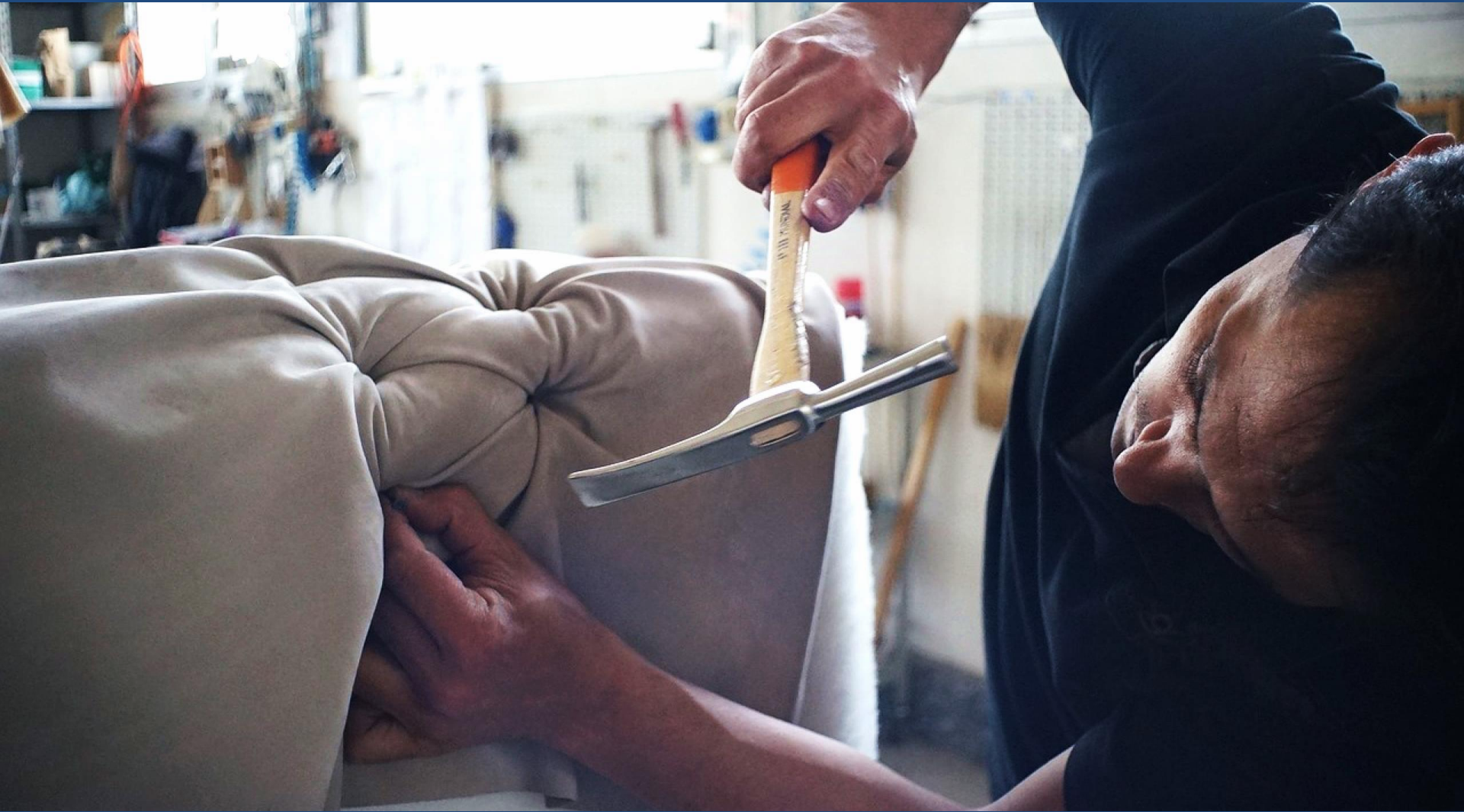
Orange = Output Related to Product

Blue = Output NOT Related to Product

Businesses save most \$ by:

- **Reduce –**
 - **Product & Process Improvements**
 - **Eliminating Wasteful Practices**
- **Reuse**
- **More Recycle and Compost**
 - **Source Separate for Quality**
 - **Highest and Best Uses**

Zero Waste Creates Jobs



10,000 tons = 1 Landfill Job



10,000 tons = 4 Compost Jobs



10,000 tons = 10 Recycling Jobs



10,000 tons = 250 Reuse Jobs



Can We Afford Zero Waste?

- Decentralized approach
- Shifts costs & responsibility to producers, providing clearer consumer choices
- Costs to decline over time for Cities or Ratepayers
- Businesses save \$ by:
 - Product & Process Improvements
 - Eliminating Wasteful Practices
 - Higher Diversion - More reuse, recycling and composting

What if We *Don't* Design for Zero Waste ?

- Mining & Manufacturing Impacts Continue
- Landfill and Incinerator Impacts and Liabilities Continue
- Need 3-6 More Planets For U.S. Lifestyle to be Replicated

Think about it

Group discussion:

- What are the barriers to Zero Waste?
- In your business?
- In your community?

Elements of a Zero Waste System



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Zero Waste Business Principles

1. Commitment to the triple bottom line
2. Use Precautionary Principle
3. Zero Waste to landfill or incineration
4. Responsibility: Takeback Products and Packaging
5. Buy reused, recycled & composted
6. Prevent pollution and reduce waste
7. Highest and best use
8. Use economic incentives for customers, workers and suppliers
9. Products or services sold are not wasteful or toxic
10. Use non-toxic production, reuse and recycling processes

Source: Zero Waste International Alliance, www.zwia.org

Zero Waste Management

UPSTREAM

- Clean Production
- Product Redesign
- Product Stewardship
- Local Markets



Designed for the Dump



Thinking **out** waste



Wrapped peeled bananas - focus of consumer action at an Austrian grocery chain

Designing Products for the Environment



Zero Waste Research Centre

- Capannori Formed in 2010
 - Operative Team
 - Scientific Committee
- Research composition of residual discards
- Propose changes to the design of badly designed products
- Ask companies to redesign products to make them more sustainable



Little Museum of Bad Industrial Design

Retail Stores Take Backs

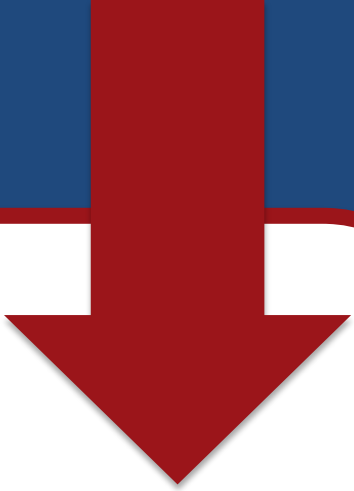


Product Policies

- Material and product bans (sale, collection, disposal)
- Voluntary or mandatory take-backs
- Advanced Recycling Fees
- Fees on single use items (e.g. bags)
- Mandatory rebates (e.g. auto batteries)
- Bottle bills
- Minimum Content
- Extended Producer Responsibility (EPR)

Zero Waste Management

DOWNSTREAM

- 
- Reuse
 - Recycle Right
 - Compost
 - Anaerobic Digestion

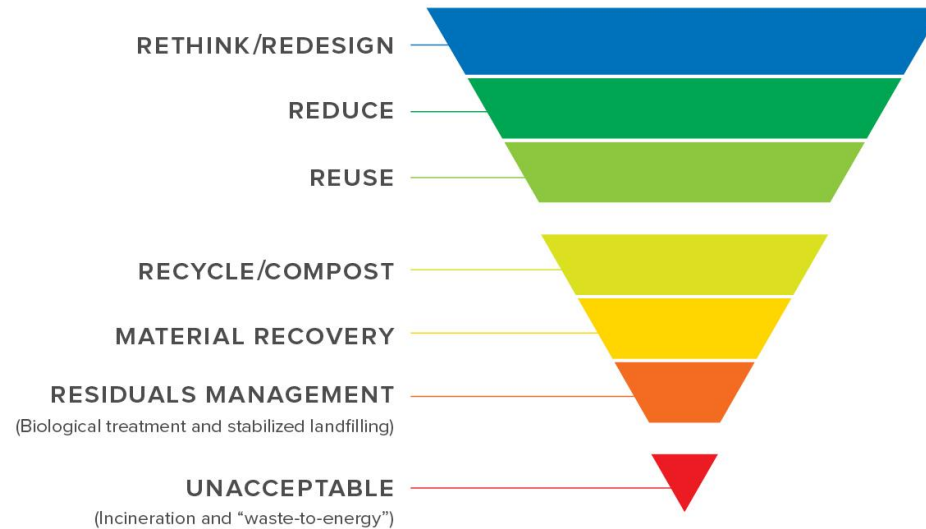
Downstream

- Ensure the highest and best use of products and packaging at the end of their useful lives
- Reuse products and packaging, retaining their original form and function
- Recycle or Compost Right for Highest and Best Use

Highest and Best Use

THE ZERO WASTE HIERARCHY 7.0

For detailed version visit www.zwia.org/zwh



Educating and Motivating Staff, Vendors & Customers

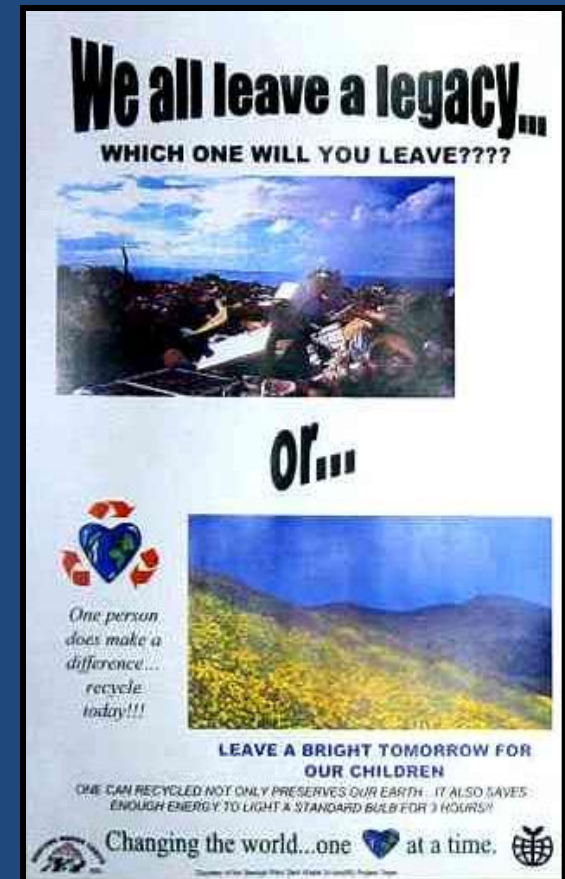


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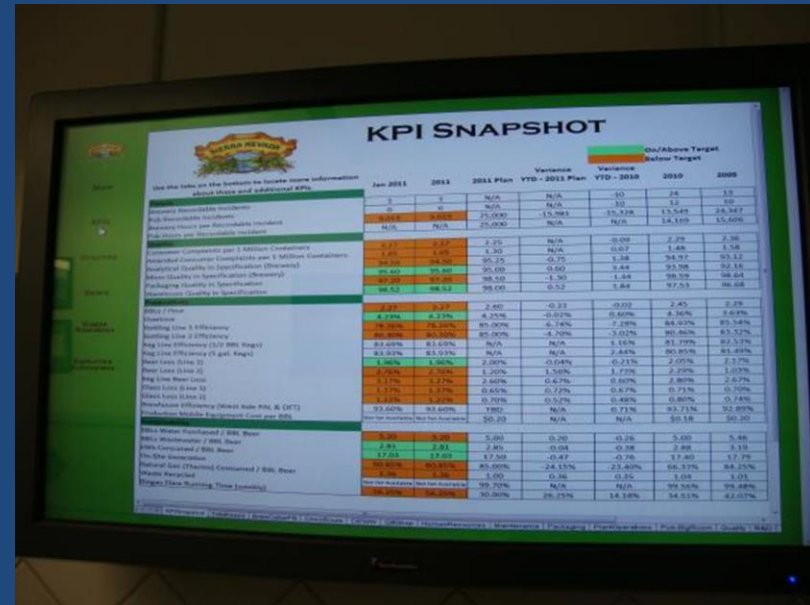
Promotion Everywhere

- Every employee must participate
- Everyone informed and educated
- Everyone does their part
- No one left behind



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



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



Resource Management (RM)

- **Traditional Hauling & Disposal Contracts** Contractor Compensation
 - Unit price based on waste volume or number of pick-ups.
- **RM Contracts**
 - Capped fee for waste hauling/disposal service. Performance bonuses (or liquidated damages) based on value of resource efficiency savings.

RM Compensation Options

➤ **Pass-Through of Service Costs with “Shared Savings” and Performance Bonus**

- **RM contractor provides all required services (e.g., tip fees, hauling fees, container rental) on a “cost pass-through” basis based on the bids received to take over existing services (Base Financial Proposal).**
- **When contractor implements changes to permanently decrease costs, contractor shares in some of those savings.**

Zero Waste Planning



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Nominate a Business

**Nominate a Business to do a Zero Waste Plan
Class Project at end of class:**

- Describe Discard Sources
- Amounts and Types of Discards
- Most Volume, Most Value, Most Toxic
- Current Costs

Zero Waste Planning

- 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 Planning



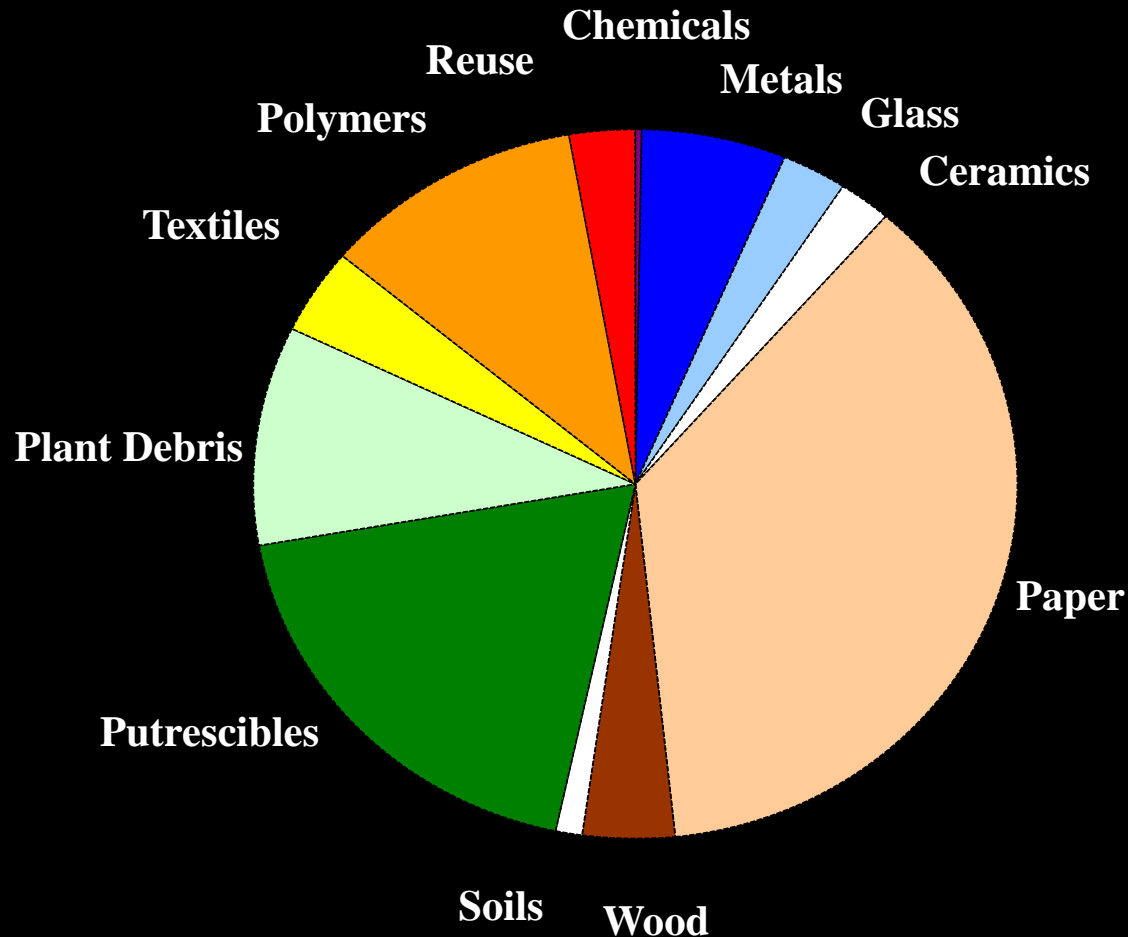
Zero Waste Planning

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



Existing System: Know Your Discards

- 12 Market Categories



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
	100	139,100		\$6,465,900
59				

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



Think about it

Group discussion:

- How can Zero Waste help solve current market challenges?

Right Sizing



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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



Why Right-Size Trash & Recycling Services?

- Businesses pay for each pick-up
- Most businesses over-subscribe
- Collecting partially full bins is one way haulers make money
- Un-flattened boxes and bags of air waste bin space
- Paying for disposal of recyclables in the trash
- Knowing what is being placed in the bin is the first step in keeping it out

Six Steps

- 1. Gather Information**
- 2. Decide When To Visit**
- 3. Decide What Time To Visit**
- 4. Conduct Visit/Visual Inspection**
- 5. Estimate Volume Disposed**
- 6. Summarize Benefits**

Step 1. Gather Information

Obtain existing Hauler data

6+ months of bills, rates sheet, services/rates

Confirm services

Bin/cart locations, types and counts and pick-up schedule

Identify local recycling services

Materials accepted, mingled or comingled, costs/rebate

Review special materials collection

HHW, CFL's, Batteries, Edible Food...

Step 2. When To Visit

Days and Hours of Operation

Days: 5 or 7 / Hours: 12 or 24

Weekly Flow – busy and light days

Heavy weekend/weekdays/special events

Heavier hours (mealtime)

Seasonal Flow

Avoid visiting at peak or slow times and holidays

Plan should accommodate for peak and slow
(increase/decrease service)

Step 3. Decide What Time To Visit

As close as possible to time of collection

Often early morning hours on the day of collection
or after hours when all trash has been deposited into
bins

Step 4. Conduct Visit/Visual Inspection

Be prepared - Recruit an assistant. Bring pens,
paper and clipboard plus camera, grabbing tools and
gloves

College Cafeteria Example

HOURS:

Monday - Friday, 6am - 7pm,
serving meals from 7am – 5pm.

STATUS:

Most meals served on paper
plates with paper sleeves.

No recycling, reuse, composting or
reusable dishware options.

SERVICE:

Three 3-cubic yard trash bins
collected daily Monday - Friday.
Cardboard pick-up free.

Worksheet #1

Current Costs and Monthly Volume

① Container/ Dumpster Volume (CY)	② Pick-Ups / Month	③ Volume of Service/ Month (① x ②)	④ Rate
TOTAL			

① # of bins x size CY of bins = Total Cubic yard of collection each time the bins are emptied

② # of pick-ups per week x 4.33 (weeks in a month) = the total # of pick-ups per month

③ Multiply ① x ② to get total Monthly CY of collection

④ Write in the cost of collection services for all bins

① Container/Dumpster Volume (CY)	② Pick-Ups / Month	③ Volume of Service/Month	④ Rate
		(① x ②)	
3 x 3 CY = 9 CY per each day collected	5/day/week x 4.33 weeks/month = 21.65 days collected each month	9 CY/day x 21.65 = 195 CY/month of total collection	
TOTAL		195 CY / month	
Worksheet #1			

- ① # of bins x size = Potential cubic yards of collection each time bins are emptied
- ② # of pick-ups per week x 4.33 (average weeks in a month) = pick-ups per month
- ③ Multiply ① x ② to get total Monthly CY of collection
- ④ Write in the cost of collection services for all bins

① Container/Dumpster Volume (CY)	② Pick-Ups / Month	③ Volume of Service/month	④ Rate
(① x ②)			
3 x 3CY = 9 CY per each day collected	5/day/week x 4.33 weeks/month = 21.65 days collected each month	9CY/day x 21.65 = 195 CY/month of total collection	\$1,404.64 x 3 = \$4,210.92/ month
TOTAL		195 CY / month	\$4,210.92 / month

↓

BIN SERVICE FOR TRASH			FREQUENCY PER WEEK			
CY	1	2	3	4	5	6
1	\$93.58	\$187.15	\$280.73	\$374.31	\$467.89	\$561.45
1.5	\$140.36	\$280.73	\$421.07	\$561.42	\$701.78	\$842.14
2	\$187.15	\$374.31	\$561.45	\$748.60	\$935.76	\$1,122.91
3	\$280.73	\$561.45	\$842.19	\$1,122.91	\$1,403.64	\$1,684.38
4	\$374.31	\$748.60	\$1,122.91	\$1,497.22	\$1,871.52	\$2,245.83
6	\$561.45	\$1,122.91	\$1,684.38	\$2,245.83	\$2,807.29	\$3,368.74
7	\$655.02	\$1,310.05	\$1,965.06	\$2,620.08	\$3,275.09	\$3,930.11

CARDBOARD: FREE

Step 5. Estimate Volume Disposed

Worksheet #2

① Bin Size	③ % Full	⑤ % Trash	⑤ % Cardboard
⑦ TOTAL Per Day			
⑧ TOTAL Per Month			

- ① Size of bin in cubic yard
- ③ Estimate how full the bin is in %
- ⑤ % of each material type based on total volume
- ⑤ Below dashed line multiply ① x ③ x ⑤ to get cubic yards per day of each material type
- ⑦ Add columns to get total weights per day
- ⑧ Multiply # of work days (#② Worksheet #1) by ⑦

Visually inspect bins after hours when all trash has been deposited

Cafeteria Example:

- **Bin #1: Full with boxes hanging over the top.**
Assume un-flattened cardboard boxes - 75%, trash bags - 25%
- **Bin #2: Half filled with un-flattened cardboard boxes.**
Assume 50% full.
- **Bin #3: Three large bags of loose trash.**
Assume 25% full.

① Bin Size	③ % Full	⑤ % Trash	⑤ % C.Brd
1. 3CY	100%	25%	75%
		.75CY	2.25CY
2. 3CY	50%		100%
			1.5CY
3. 3CY	25%	100%	
		.75CY	
⑦ TOTAL Per Day		1.5CY X 5 days	3.75CY X 5 days
⑧ TOTAL Per Mon	multiply by 4.33 weeks per month	32.5CY Month	81CY Month

① Size of bin in cubic yard

③ Estimate how full the bin is in %

⑤ % of each material type based on total volume

⑤ Below dashed line multiply **①** x **③** x **⑤** to get cubic yards per day of each material type

⑦ Add columns to get total weights per day

⑧ Multiply # of work days (#**②** wksh #1) by **⑦**

Step 6. Summary of Right-Sizing Benefits

Per Month	Before	ASer
Level of Trash Service	195 CY	65 CY
Cost	\$4,210	\$842
Recycling	0	65 CY
# of Bins	3 Trash	1 Trash 1 Cardboard Recycling

- **Savings** (In this example: \$2,809/month (\$4,210 minus \$1,403.64))
- **Recycling Implemented**
 - Cardboard flattened
- **Reduction in # of bins onsite** (property space has a value)
- **Potential for fewer truck trips**
- **Better understanding of what's still in trash**

Zero Waste Purchasing



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Purchasing for Zero Waste

- **Precautionary Principle**
- **Return to Vendor**
- **Lease, Rent and Share Equipment**
- **Reduce Packaging**
- **Reusable Shipping Containers**
- **Buy Recyclable, Recycled and Compostable Items**
- **Buy Remanufactured Equipment**
- **Purchase Durables**
- **Buy Less Toxic Products**

Zero Waste Resources



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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

Why Zero Waste Certification?

- Business wants protection against claims of fraud and to comply with Federal Trade Commission Green Marketing Guidelines
- Third Party is more Credible
- Demonstrates you are for Highest and Best Uses
- If Zero Waste allowed to include burning and burying, term will lose value and be meaningless

Zero Waste Resources

- Zero Waste USA: www.zerowasteusa.org
- Zero Waste International Alliance: www.zwia.org
- TRUE Zero Waste: www.TRUE.gbci.org/projects
- MO Dept. of Natural Resources:
<https://dnr.mo.gov/env/swmp/rrr/>
- U.S. EPA WasteWise:
<https://www.epa.gov/smm/wastewise>
- U.S. EPA Managing and Transforming Waste Streams:
www.epa.gov/managing-and-transforming-waste-streams-tool-communities

The Zero Waste Economy

Designing a Full-Cycle System—Upstream AND Downstream

Design for the Environment, Not the Dump

All products must be recoverable through reuse, recycling or composting



Shifting Subsidies

Stimulating green practices rather than favoring waste and pollution



Changing the Rules

Removing market barriers and inequities to support sustainable industry



Jobs, Jobs, Jobs

Redesign and recovery create more jobs than resource destruction



Clean Production

More resource efficient and recoverable, less toxic to workers, environment and consumers



Retail Stores

Opportunity for consumer education and product take-back



Consumer Buying Power

Creating market demand and a new manufacturing standard



Producer Responsibility

Manufacturers are part of the solution, taking back their own products or supporting recovery infrastructure



Resource Recovery Parks

Community center for total recovery—reuse, recycling and composting—material exchange, and education



Contacts:

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www.zerowasteusa.org

Exam:

<https://www.surveymonkey.com/r/ZWBMORAEval>

Evaluation:

<https://www.surveymonkey.com/r/ZWBMORAEval>

A serene sunset scene with the sun low on the horizon, casting a warm orange glow across the sky and reflecting on the water. Silhouetted hills and trees are visible in the foreground and middle ground.

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

Zero Waste USA
zerowasteusa.org

Class Project

Zero Waste Plan for a Business

1. Overview of Site Functions, Size & Generation Areas
2. Types, Amounts & Sources of Materials
3. Design waste out and ID EPR options
4. ID service opportunities
5. Policies, Programs and Facilities needed
6. Zero Waste Challenge or Event
7. Funding and Incentives
8. “Low-hanging” fruit & long term goals