

Helping Business  
Save Green by Going Green!  
WasteCap Nebraska's  
Assessment Technical Assistance

2010 WORKS!  
March 23, 2010  
Junction City, KS



**WasteCap**  
NEBRASKA

# Three Presentations in One

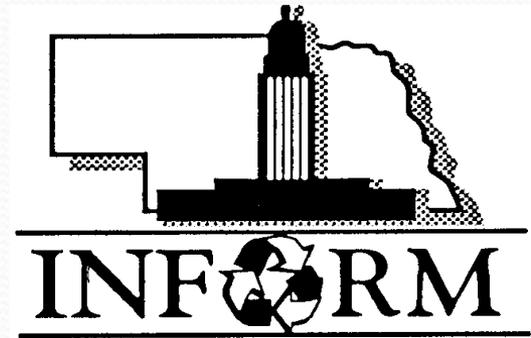
- WasteCap History and Services
- General Waste Assessments
- Construction and Demolition Waste Management

# WasteCap Nebraska

- WasteCap History
- What is in our waste?
  - NDEQ Waste Characterization
- What are we doing now?
  - Lincoln efforts
  - Business efforts example
  - Impacts of recycling
- What services are offered

# WasteCap Nebraska History

- INFORM created by local business community in 1992
- WasteCap of Lincoln created as partnership of City of Lincoln and Lincoln Chamber of Commerce in 1994



# WasteCap Nebraska

- Created in March 2005 as a spin-off of the Lincoln Chamber of Commerce
  - Formed as a non-profit organization (501c6)
  - Expanded services to several communities in Nebraska
- 2010 Applying for IRS recognition under 501C3



# WasteCap Nebraska's Mission

- To provide resource conservation assistance to Nebraska businesses.



# What does that mean?

- WasteCap Nebraska is a member based, nonprofit organization dedicated to helping businesses design and adopt environmentally friendly practices that increase their profitability.

# WasteCap Nebraska's Funding

- Nebraska Department of Environmental Quality (NDEQ) Grants
- Nebraska Environmental Trust (NET) Grants
- City of Lincoln
- Membership dues
- Special projects
- Fees for service



# WasteCap Programs

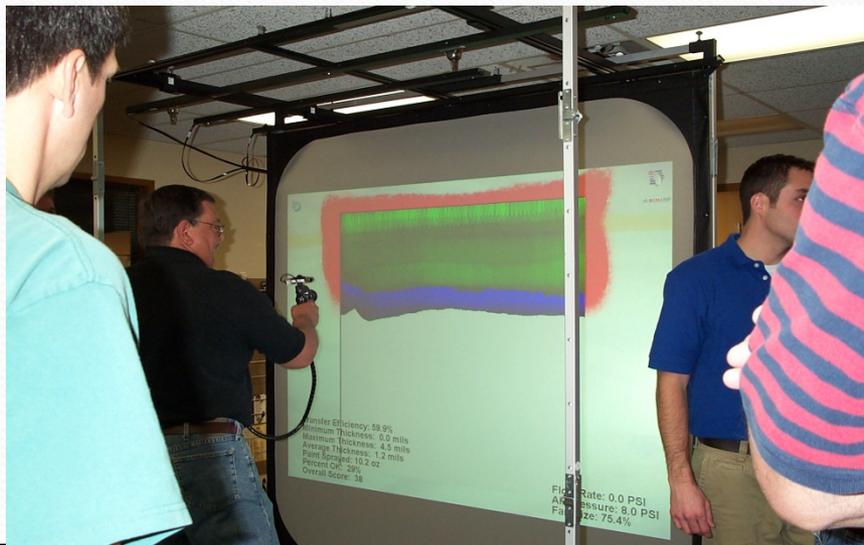


- Take-it-Back Nebraska
- Green Team Roundtable
- C&D Waste Management
- Batteries
- Cell Phones
- Recycle at Home



# WasteCap Programs

- Member Volumes
- Master Agreements
- Market Development
- ESCRAP Nebraska
- Another Bright Idea
- Finishing Technologies



# Special Projects

- Earth Day
- Shred Day
- Water/energy
- Recycle Yourself
- P2 Week
- Clean Your Files Week
- America Recycles Day



# What Services Are Available?

- Waste Assessment
- UNL P<sub>3</sub> assistance
  - Energy, water, waste
- C&D Waste Management
- Employee Training



# FINAL REPORT

## STATE OF NEBRASKA WASTE CHARACTERIZATION STUDY



*Prepared for*

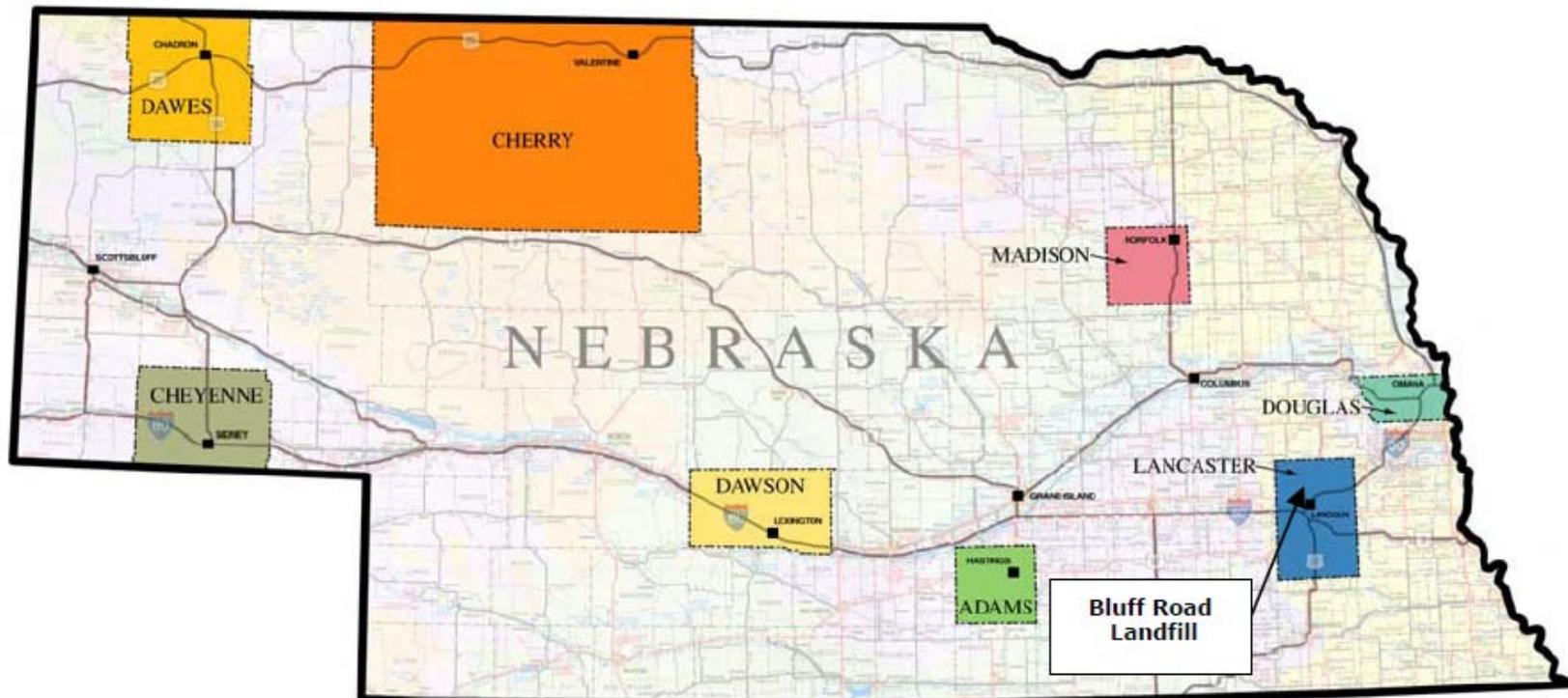
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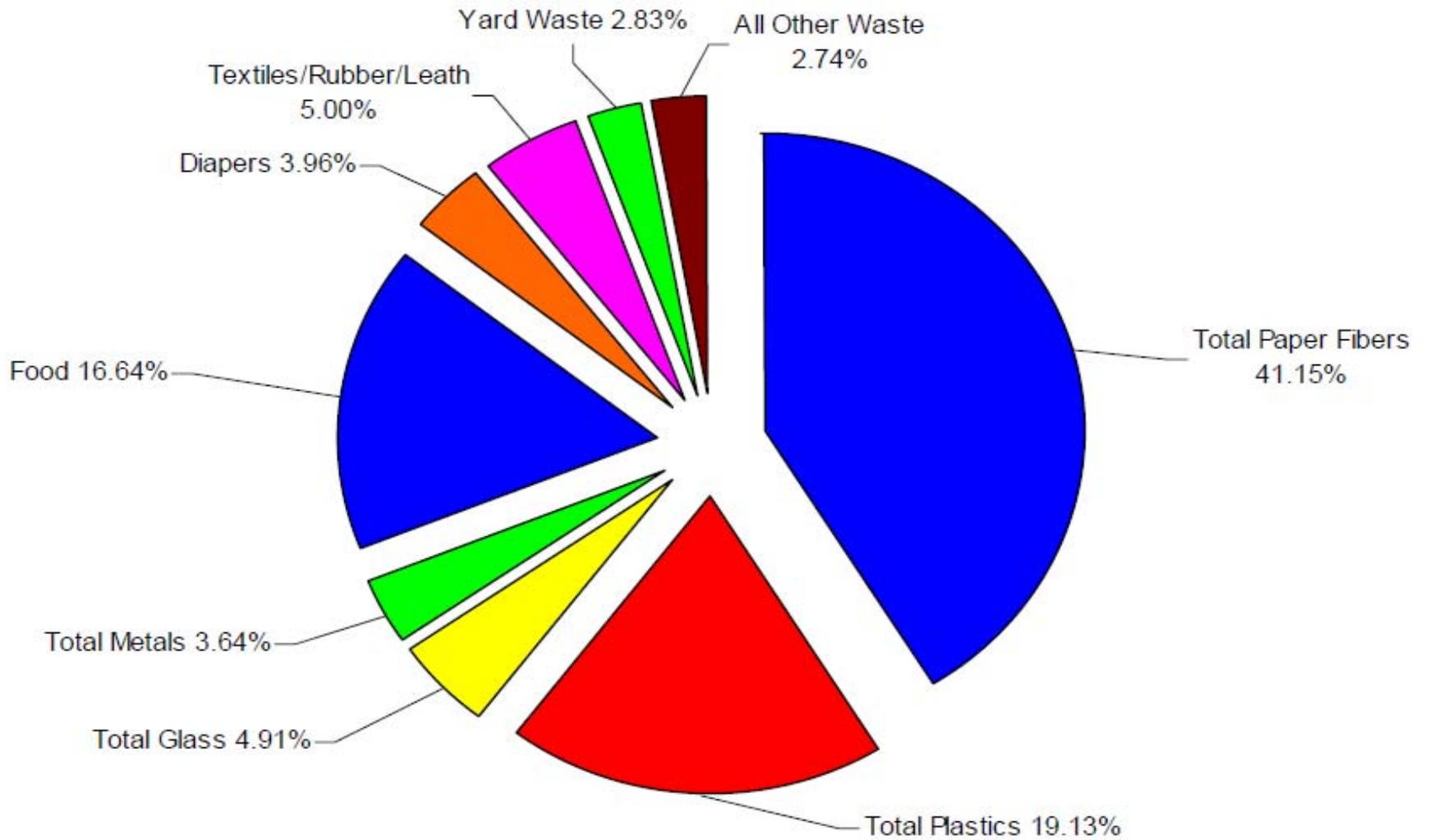
**March 9, 2009**



# The Study

- Four season sort of 8 landfills
- Sorted by rural/urban, residential/commercial
- 624 samples, 50 classifications
- Largest waste streams (by weight) include:
  - paper fibers – 41.15%
  - plastics – 19.13%
  - food – 16.64%
- Total of the three – 76.92% by weight





# Interesting facts

- 3.96% of waste is diapers. The majority are adult diapers.
- E-waste - more than 30% of the loads
- Furniture – more than 60% of the loads
- C&D – more than 75% of sampled loads
- Most of these categories can be reused or recycled

# Bluff Road Landfill

- Began siting in 1984
- \$4.5 M General Obligation Bonds
- 4 years to site and construct the facility
- Opened in Fall 1988, Project life until 2034
- Will be the largest man-made structure in the county
  - 170 acres, 150 feet taller than current grade
- Paper and plastic are over 80% by volume

# Lincoln Recycling

- 1992 – 2008 recycling has added 5.5 years to the life of the landfill
- 33 recycling drop-off sites in county
  - 7,347 Tons collected last fiscal year
- 6 subscription recycling services
  - Est. 15% of pop'n subscribes
  - collects 4,500 – 5000 Tons recyclables

<u>Material</u>	<u>Total 2007</u>	<u>Total 2008</u>	<u>WasteCap 2008 Total</u>
<b>Office Paper</b>	82,940 Pounds	58,344 Pounds	6655 Tons
Cardboard	1900 Pounds	1700 Pounds	2729 Tons
Magazines	650 Pounds	600Pounds	448 Tons
Newspaper	2200 Pounds	2100 Pounds	1149 Tons
Telephone Books	400 Pounds	325 Pounds	27 Tons
Plastic	25 Pounds	25 Pounds	814 Tons
Glass	Pounds	Pounds	75 Tons
Metal	Pounds	Pounds	182 Tons
Steel	200 Pounds	1000 Pounds	5020 Tons
Tin	Pounds	Pounds	27 Tons
Aluminum	86 Pounds	112Pounds	415 Tons
Copper	Pounds	Pounds	1079 Tons
Pallets	30 Pounds	17 Pounds	611 Tons
<b>Total Pounds Recycled</b>	<b>95,337.5 Pounds</b>	<b>69,818.30 Pounds</b>	
<b>Total Tons Recycled</b>	<b>47.67 Tons</b>	<b>34.9Tons</b>	<b>26,514 Tons</b>
<b>Total Annual Tipping Fee Landfill Savings</b>	<b>\$1001.04</b>	<b>\$733.09</b>	
<b>WasteCap Total Tipping Fee Landfill Savings</b>	<b>\$631,969</b>	<b>\$404,517.46</b>	

<u>Miscellaneous Materials</u>	<u>2007 Total</u>	<u>2008 Total</u>	<u>WasteCap 2008 Total</u>
<b>Fluorescent Light Tubes</b>	418 Tubes	439 Tubes	21,648 Tubes
<b>Batteries</b>	30 Pounds	Pounds	5 Tons
<b>Ballasts</b>	305 Pounds	Pounds	12 Tons
<b>Mercury</b>	Pounds	Pounds	1 Ton
<b>Toner Cartridges</b>	209 Cartridges	180 Cartridges	29,415 Cartridges
<b>Cell Phones</b>	Phones	Phones	50 Phones
<b>Oil</b>	Gallons	Gallons	402,948 Gallons
<b>Solvents</b>	Gallons	Gallons	198,832 Gallons
<b>Other Liquids</b>	Gallons	Gallons	124,400 Gallons
<b>Other Misc. Items</b>	1588 Pounds	Pounds	595 Tons
<b>Tires</b>	Tires	Tires	4434 Tons
<b>Computer Equipment</b>	2136 Pounds	3600 Pounds	231 Tons
<b>Televisions</b>	Pounds	Pounds	0 Pounds
<b>Drums</b>	Pounds	Pounds	2 Tons

# Impacts of recycling in 2008

- **Electronics** 3,595 pounds of computer and electronics equipment recycled, diverting:
  - 568 pounds of mixed plastic
  - 809 pounds of leaded glass
  - 1,141 pounds of metals
  - 5.1 pounds of precious metals
  - 0.58 pounds of other hazardous wastes

# Impacts of recycling in 2008

- **Fiber** - **63069** pounds of fiber products recycled resulting in conserving:
  - **536** Trees
  - **132,445** Kilowatt Hours of Energy
  - **756,828** Gallons of Water
  - **1,892** Pounds of Air Pollution
  - **104.1** Cubic Yards of Landfill Space
  - **\$662.22** in Landfill Tipping

# Impacts of recycling in 2008

- **Fluorescent Lighting** 439 fluorescent light tubes recycled and/or 407 pounds of fluorescent lighting recycled, diverting:
  - 346 pounds of glass
  - 9 pounds of metal
  - 20,324 milligrams (mg) of mercury



Questions?

**NEXT: Waste Assessments**

# Waste Assessments

- Application
- Where Do You Start?
- Process Overview
- Metrics
- What to Look for
- Quick Hits
- Conclusion

# WasteCap Nebraska

## Assessment Application

Thank you for your interest in a WasteCap Nebraska resource assessment. A portion of these services are provided by funding from the City of Lincoln and/or the Nebraska Department of Environmental Quality. Remaining funds are raised through membership dues and fee-based services provided by WasteCap Nebraska.

Because a resource assessment is time-intensive, a written commitment is required for WasteCap to provide this service. Listed below are the time and resource commitments required prior to, during and following your business's assessment.

1. Top-management support is essential to the success of any sustainability program. A brief **pre-assessment meeting** must be arranged with decision-makers for the company before the assessment can commence. Following completion of the assessment report, a **post-assessment meeting** must be arranged with management to review the recommendations and timeline for implementation.
2. A contact person capable of completing a **pre-assessment survey** and having familiarity with operations and current practices must be made available to WasteCap staff for the **on-site assessment** and **post-assessment follow-up**.

WasteCap Nebraska members receive assessments as a membership benefit in addition to other valuable features. Please review the enclosed membership materials to find out if membership is a good option for your business. Otherwise, WasteCap can provide a fee-based proposal for services based on one of the assessment tiers plus any custom services desired as described in the membership materials. We look forward to assisting you in your waste reduction, recycling and sustainability goals. Please contact WasteCap Nebraska at (402)436-2383 or 888-EWASTE9 to discuss the plan that is right for your business.

# Assessment Commitment

## WasteCap Nebraska Assessment Application Signatures

\_\_\_\_\_ (business name) commits to the above requests of WasteCap  
Nebraska.

\_\_\_\_\_ (business name) commits to providing staff time and resources to  
implement technically and economically feasible recommendations within a time  
period to be established.

I pledge my support to move forward with a WasteCap assessment and agree to attend a  
pre- and post- assessment meeting to discuss the project.

\_\_\_\_\_  
Member of Upper Management's Signature

\_\_\_\_\_  
Date

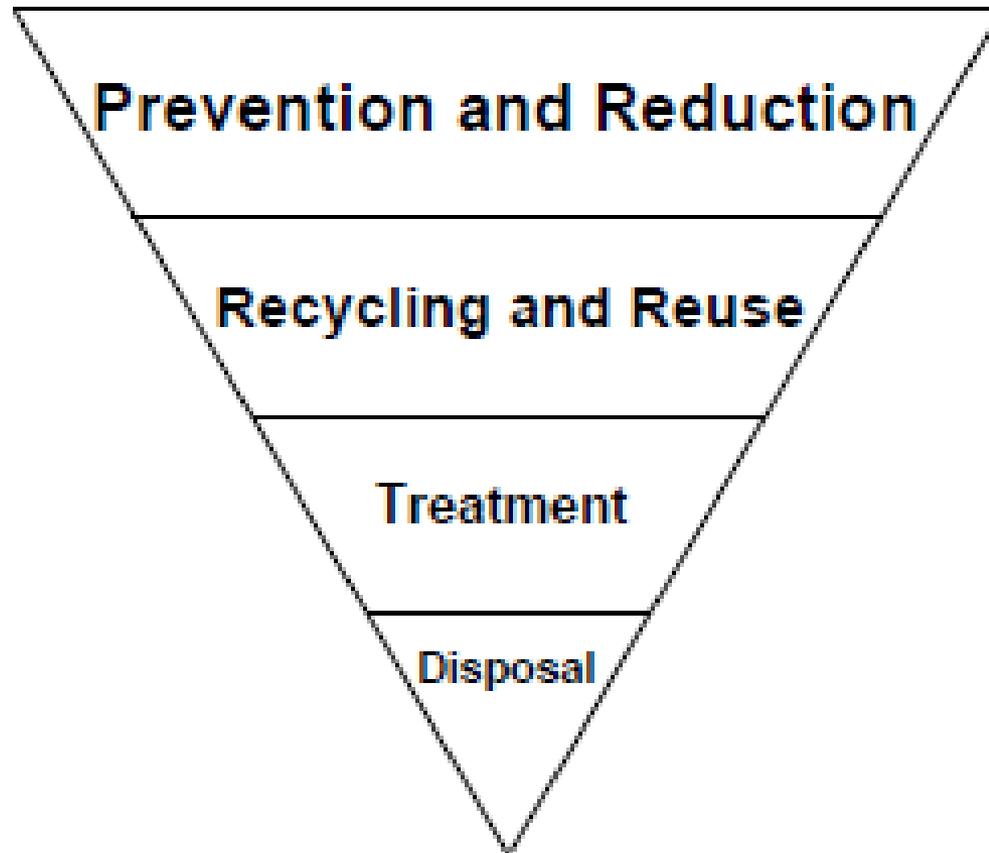
\_\_\_\_\_  
Printed Name

\_\_\_\_\_  
Title

# Where Do You Start?

- At the Highest Environmental Impact
  - Hazardous Waste
  - Largest Volume
- At the Highest Potential Profit/Savings
  - What is in your trash?
  - How much do you dispose of these components?
  - What is your process for handling your waste?

# P2 Hierarchy



# Process Overview

- Things in Common for most businesses
  - Utilities
  - Cafeteria/lunchrooms
  - Offices
- Hospital
- Manufacturing Facility

# Metrics

- Utility Bills
  - Electricity
  - Gas
  - Water
  - Solid Waste (trash)
  - Hazardous/universal waste disposal
  - Recycling



# Metrics

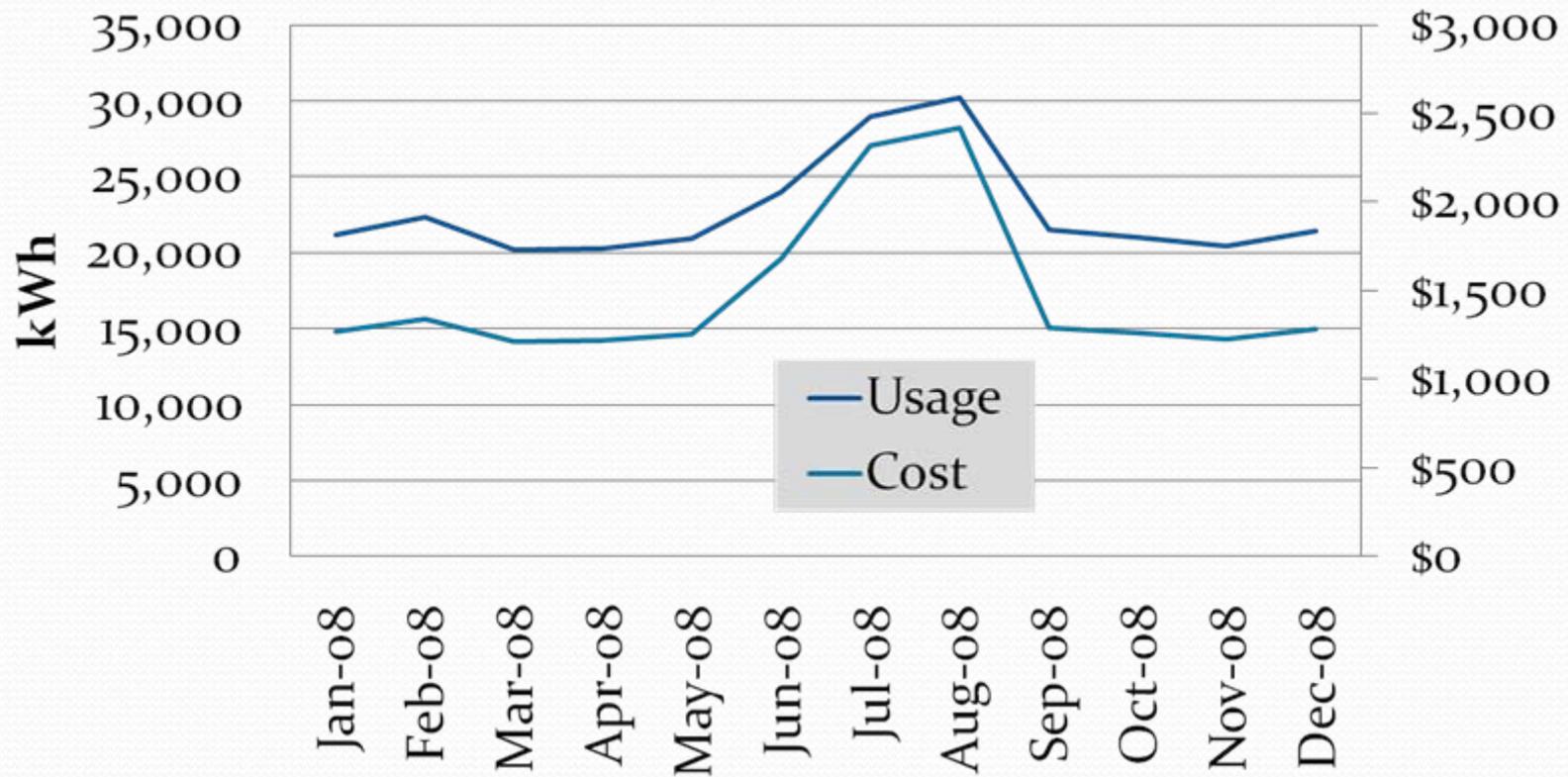
- Purchasing Records – Monthly weights and costs.
  - Raw Materials
  - Paper
  - Cafeteria Supplies



# Electricity

<b>Month</b>	<b>Usage kWh</b>	<b>Cost \$</b>	<b>Unit cost \$/kWh</b>
Jan-08	21,200	\$1,272	\$0.06
Feb-08	22,300	\$1,338	\$0.06
Mar-08	20,200	\$1,212	\$0.06
Apr-08	20,300	\$1,218	\$0.06
May-08	20,900	\$1,254	\$0.06
Jun-08	24,000	\$1,680	\$0.07
Jul-08	29,000	\$2,320	\$0.08
Aug-08	30,200	\$2,416	\$0.08
Sep-08	21,500	\$1,290	\$0.06
Oct-08	21,000	\$1,260	\$0.06
Nov-08	20,400	\$1,224	\$0.06
Dec-08	21,400	\$1,284	\$0.06
<b>Total</b>	<b>272,400</b>	<b>\$17,768</b>	<b>\$ 0.07</b>

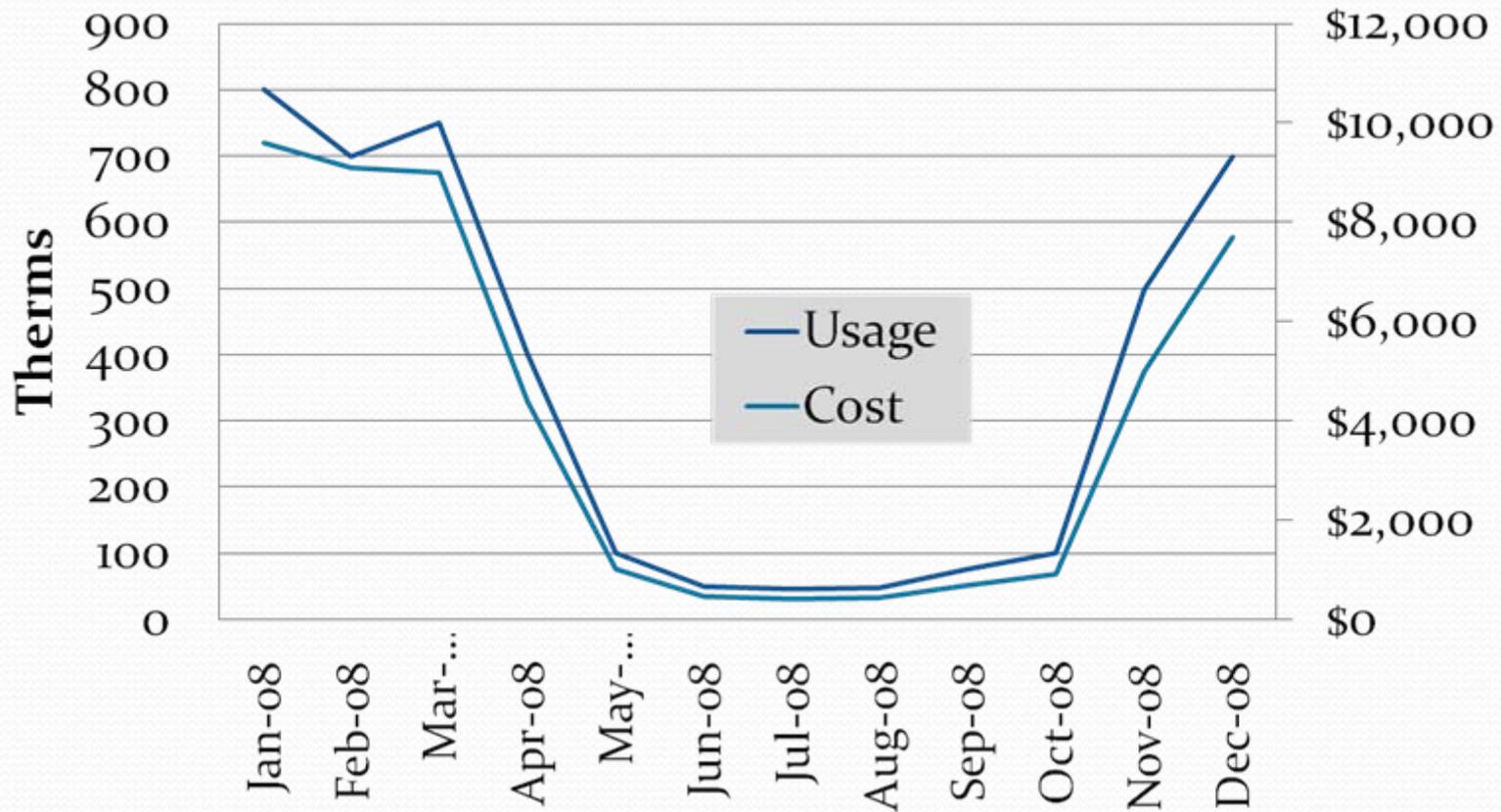
# Electricity Usage



# Natural Gas

<b>Month</b>	<b>Usage Therms≈CCF</b>	<b>Cost \$</b>	<b>Unit cost \$/Therm</b>
Jan-08	800	\$9,600	\$12.00
Feb-08	700	\$9,100	\$13.00
Mar-08	750	\$9,000	\$12.00
Apr-08	400	\$4,400	\$11.00
May-08	100	\$1,000	\$10.00
Jun-08	50	\$450	\$9.00
Jul-08	45	\$405	\$9.00
Aug-08	48	\$432	\$9.00
Sep-08	75	\$675	\$9.00
Oct-08	100	\$900	\$9.00
Nov-08	499	\$4,990	\$10.00
Dec-08	700	\$7,700	\$11.00
<b>Total</b>	<b>4,267</b>	<b>\$48,652</b>	<b>\$ 11.40</b>

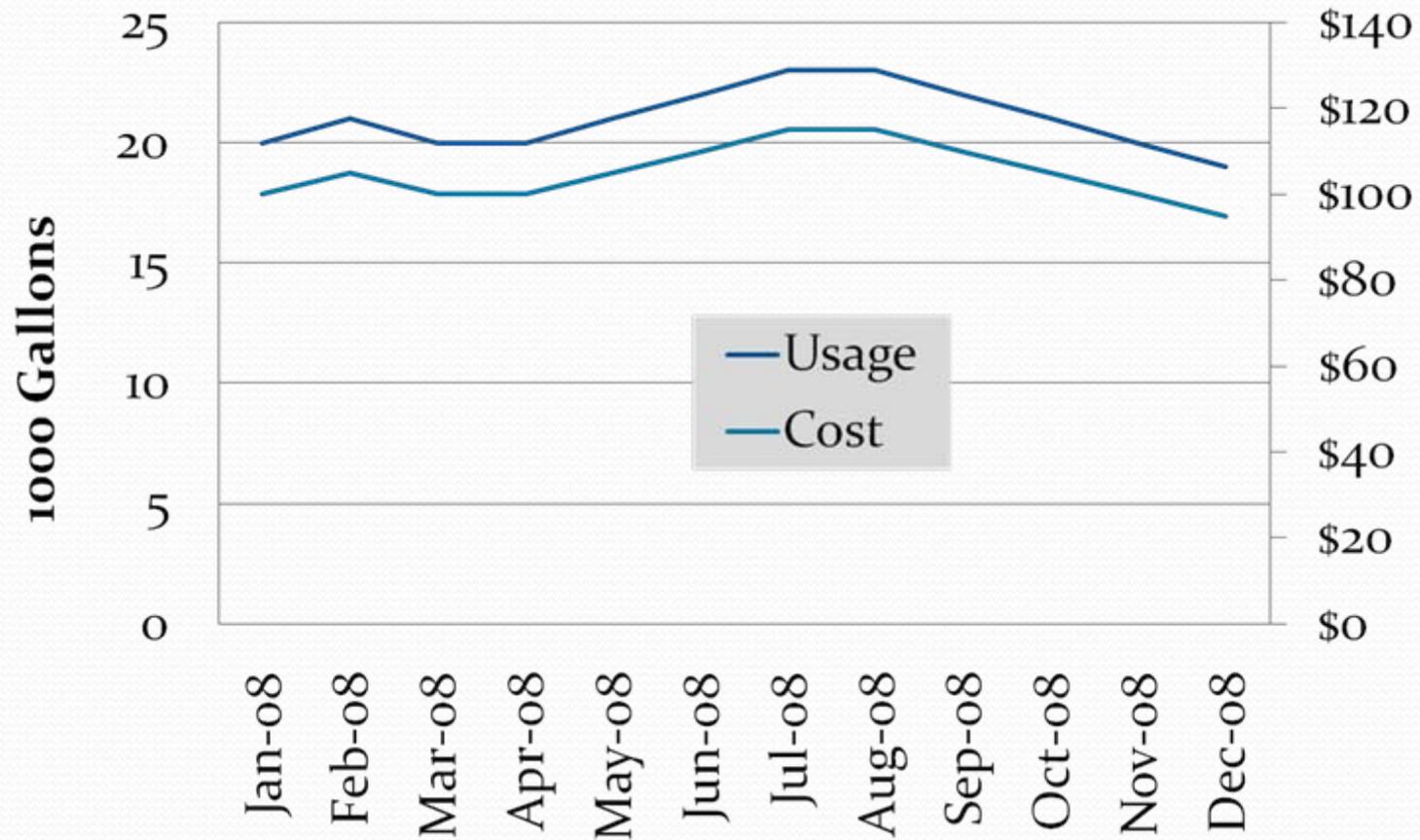
# Natural gas Usage



# Water Usage

<b>Month</b>	<b>Usage 000 Gal</b>	<b>Cost \$</b>	<b>Unit cost \$/gal</b>
Jan-08	20	100	0.005
Feb-08	21	105	0.005
Mar-08	20	100	0.005
Apr-08	20	100	0.005
May-08	21	105	0.005
Jun-08	22	110	0.005
Jul-08	23	115	0.005
Aug-08	23	115	0.005
Sep-08	22	110	0.005
Oct-08	21	105	0.005
Nov-08	20	100	0.005
Dec-08	19	95	0.005
<b>Total</b>	<b>252</b>	<b>\$1,260</b>	<b>\$ 0.005</b>

# Water Usage



# Trash

Month	Pickups No	Cost/PU	Tot PU Costs	Total Wt (all PU's)	Tipping \$/Ton	Tot Tipp Costs	Tot Costs \$	Unit cost \$/Ton
Jan-08	4	\$50	\$200	4.36	\$30	\$131	\$331	\$75.87
Feb-08	4	\$50	\$200	4.36	\$30	\$131	\$331	\$75.87
Mar-08	6	\$50	\$300	6.54	\$30	\$196	\$496	\$75.87
Apr-08	3	\$50	\$150	3.27	\$30	\$98	\$248	\$75.87
May-08	4	\$50	\$200	4.36	\$30	\$131	\$331	\$75.87
Jun-08	6	\$50	\$300	6.54	\$30	\$196	\$496	\$75.87
Jul-08	7	\$50	\$350	7.63	\$30	\$229	\$579	\$75.87
Aug-08	4	\$50	\$200	4.36	\$30	\$131	\$331	\$75.87
Sep-08	2	\$60	\$120	2.18	\$30	\$65	\$185	\$85.05
Oct-08	4	\$60	\$240	4.36	\$30	\$131	\$371	\$85.05
Nov-08	2	\$60	\$120	2.18	\$30	\$65	\$185	\$85.05
Dec-08	4	\$60	\$240	4.36	\$30	\$131	\$371	\$85.05
Total	50		\$2,620	55		\$1,635	\$4,255	\$78.07

# Purchasing/Other Records

- Paper volume/month
- Hazardous Waste – Volumes/Month
- Raw Materials



# Where to Look

- Type of Space
  - Electricity
  - Gas
  - Water
  - Solid Waste
  - Universal/Hazardous Waste

# Culture

- Pollution Prevention (P2) Statement? Posted?
- P2 Cause Champion/Green Team?
- How do employees regard recycling?
  - How much is done in your estimation?
  - How good is the recycling program?
  - What is recycled?
- How is trash currently collected?
- What waste/environmental programs participating in? (e.g. WasteWise, etc.)



# Offices

- Electricity/Gas
  - Empty offices with lights on?
  - Light sensors/switch labels?
  - Exit Signs incandescent vs. LED?
  - Where are thermostats? How managed?
    - Setback? Left Alone? Anyone can touch?
  - Computers/Monitors – Default/sleep mode?
  - Lighting: General/Task
    - How switched? Timers, etc.



# Offices

- Solid/Hazardous Waste
  - Copier
    - Default double-sided copies?
    - Recycle bin next to copier?
  - Printers – default double-sided copies?
    - Robust enough to handle?
  - Shredding procedures?
    - How disposed?
  - Lights – Green-tipped?



# Bathrooms

- Electricity
  - Motion sensors/light switch labels?
  - Are lights on when you enter (and no one is in there?)
  - Is it cold (in summer)?
- Gas
  - Is it hot (in winter)?
- Water
  - Low flow toilets/urinals?
  - Faucet aerators (for low-flow)
- Solid Waste
  - Hand Dryers (high efficiency better) vs. Paper Towels?



# Cafeterias/Lunch Rooms

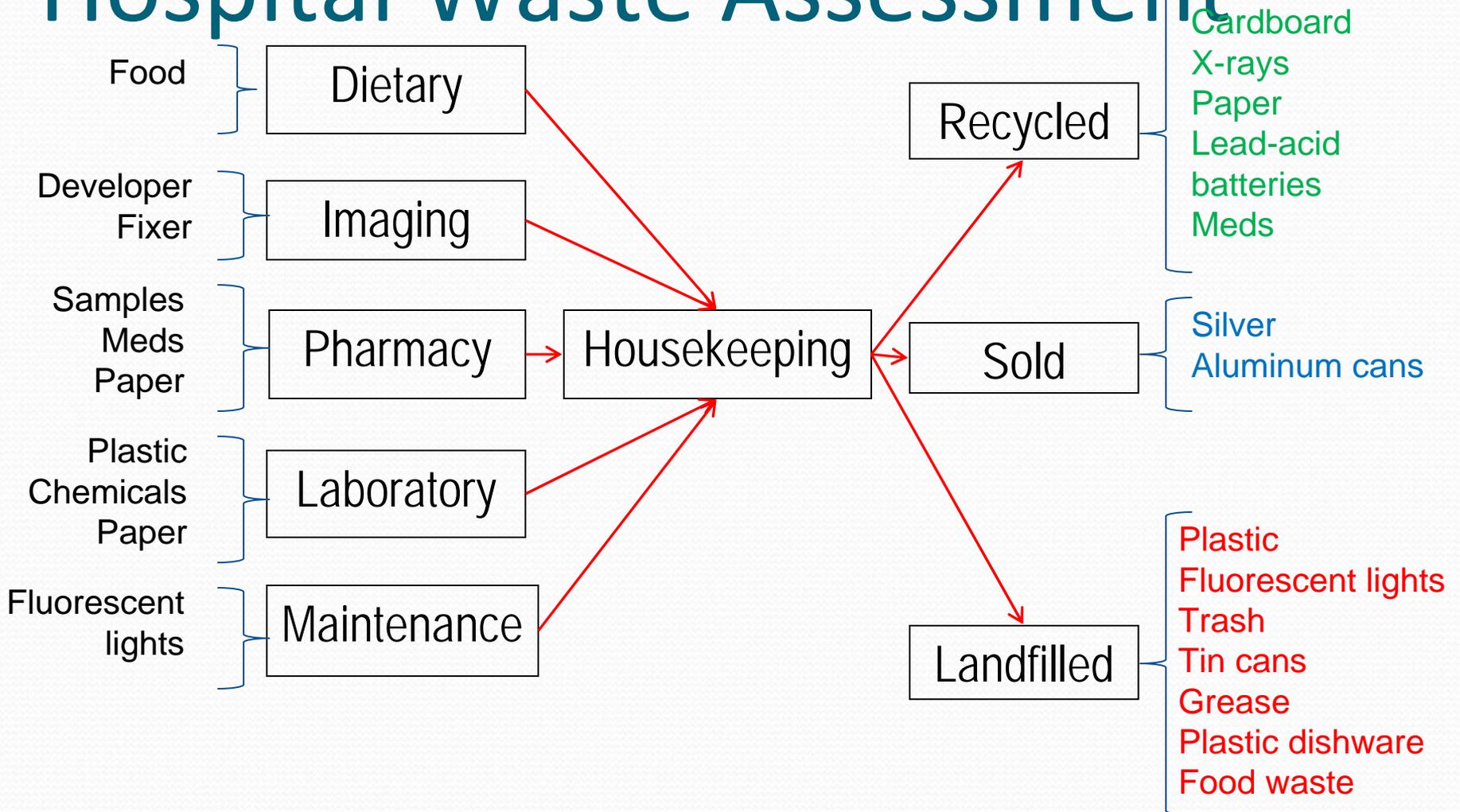
- Electricity/Gas
  - Thermostat operation
  - Light operation
- Solid Waste (huge)
  - Plastic/Aluminum beverage containers
  - Dishware/utensils
  - Napkin dispensers
  - Amount of food produced vs. wasted
  - Composting?



# Hospitals

- Solid Waste
  - Electronic files vs. paper?
- Hazardous/universal waste
  - Mercury Policy
  - Mercury—actual disposal
  - Redbag waste
- Pharmaceuticals

# Hospital Waste Assessment



# Hospital Waste Stream Tabulation

Item	Qty	Units	Disposal Method	Waste Service Provider
Paper	5,000	lb/yr	Shredded and recycled	Shingling
Cardboard	23,400	lb/yr	Recycled off-site	Ideal Grocery
Plastic	3000	bottles/yr	Landfilled	Butler County Landfill, Inc
Aluminum cans	minimal	n/a	Recycled off-site for minimal profit	McKee Recycling
X-ray films	minimal	n/a	Recycled off-site	NT & H Enterprises L.L.C
Silver (reclaimed)	minimal	n/a	Recycled off-site	NT & H Enterprises L.L.C
Fluorescent lights	350	bulbs/yr	Landfilled	Butler County Landfill, Inc
Electricity	1,692,320	kW/yr	Consumed	Superior Utilities
Natural gas	79,660	ccf/yr	Consumed	Superior Utilities
Water	2,591	ccf/yr	Sewer	Superior Utilities
Single-use dishware	10	yd <sup>3</sup> /yr	Landfilled	Butler County Landfill, Inc
Trash	2028	yd <sup>3</sup> /yr	Landfilled	Druba John Trash Hauling
Grease	1170	lb/yr	Landfilled	Butler County Landfill, Inc
Lead batteries	minimal	n/a	Recycled off-site	Grainger
Tin cans	443	lb/yr	Landfilled	Butler County Landfill, Inc

**TURN ME**



**OFF**

# Specific Recommendations

Table 1. Pollution Prevention Opportunities



<b>P2 OPPORTUNITY</b>	<b>EXPLANATION</b>	<b>POTENTIAL SAVINGS</b>
<b>ENTIRE HOSPITAL</b>		
<b>Double-sided copy/print</b>	Reduces purchasing costs and waste stream volumes.	\$4,000/yr
<b>Thermostat management</b>	Conserves energy and reduces heating and cooling costs.	\$1,818/yr
<b>FOOD SERVICES</b>		
<b>Recycle grease</b>	Provides additional profit with no added expense.	\$175.50/yr
<b>Reusable dishware</b>	Reduces purchasing costs and waste volumes.	\$1,303.72/yr
<b>MAINTENANCE</b>		
<b>Light switch reminders</b>	Lowers energy consumption in private offices up to 15%.	\$92/yr
<b>Install occupancy sensors</b>	Improves energy savings without compromising lighting.	\$552/yr

# Manufacturing

- Purchasing
  - Raw Materials
- Solid Waste
  - Focus on recyclables (e.g. metal, etc.)
  - % Recycled
  - % Wasted
- Hazardous Waste
  - Volume (weight)/month
  - Type

# Manufacturing

- Electricity/Natural gas
  - Thermostats
  - Lights
- Spills
  - Absorbent/disposal
- Water
  - Leaks, etc.

# Miscellaneous

- Dumpster
  - You must dive!
  - Estimate the volumetric proportions
  - Recyclables?
    - What? How much?
- Solid Waste
  - Cardboard!
    - Trashed
    - Recycled
    - Bailed and Recycled?



before



after

# Follow Up

- Utility Bills
  - Electricity ↓
  - Gas ↓
  - Water ↓
  - Trash ↓
  - Recycling ↑
- Purchasing ↓
  - Raw Materials ↓
  - Paper ↓
  - Cafeteria Supplies ↓
  - Etc.



Questions?

NEXT: C&D Waste Management

# Construction & Demolition Waste Management

Presented by:  
Carrie Hakenkamp  
WasteCap Nebraska



# Why Recycle?

- The right thing to do
- Sustainable building/LEED Points
- Get ahead of regulations
- Meet market demand
- Relatively clean, high-value materials
- Interest and activity growing -- Becoming “the way it is”

# Common Benefits

- Environment – Saves natural resources
- Economics - Disposal costs reduced
- Ease - Contractors find recycling simple and not time consuming
- Safety – Recycling sites tend to be cleaner, safer work sites
- Positive public image for project

# Environmental Benefits

## Recycling a Ton of:

- paper saves 17 trees
- iron saves 1 ton of coal



- plastic saves the equivalent of 1-2,000 gal of gas
- aluminum saves equivalent to electricity used by WI home over 10 years

# Leadership in Energy and Environmental Design

- Two or more points
- One: 50% diversion
- Two: 75% or more diversion
- Other: Innovation point
- Same points available through Green Guidelines for Healthcare

# Steps to Setting Up a Successful Construction or Demolition Waste Reuse and Recycling Program



# Step 1 - Commit

- Get buy in from someone with project authority
- Put recycling in specifications/contracts
- Determine who will control debris
- Include waste reduction from the start
- Select a coordinator

## Step 2 – Identify Target Materials



- What materials will be generated in large quantities?
- When?
- Of those materials, what can you most easily separate?
- Look for materials with existing recycling markets (and find new markets).

## Step 2 - Demolition

- Conduct site visit to identify reusable materials
- Create list of potential markets
- Contact possible markets for reusable materials (insurance)
- Ensure compliance with hazardous waste regs



## Step 3 - Write Request for Hauling

- Develop vendor list
- Ask:
  - What materials accepted?
  - What happens to materials?
  - For documentation, education and signs
- Allow bidding on specific materials
- Select hauler(s)

# Step 4 – Develop Recycling Plan (required by LEED)

- What are your recycling goals?
- Materials to be recycled
- Who will haul?
- What will happen to materials?
- How will you educate, monitor, document & enforce?

## Step 5 – Make Decisions on Site Logistics

- Determine where and when to place dumpsters
- Trash containers next to recycling!
- Order clear signs for dumpsters, fence, carts, trailer



# Step 6 - Monitor



# Step 7 - Educate



- Every job site meeting
- Worker orientation
- Site superintendent, safety coordinator, & foremen
- Lunches

# Step 7 - Educate

Clearly-labeled,  
well-placed  
dumpsters are  
keys to success



# Step 8 - Document

(required for LEED)

- Ask trash and recycling service providers to provide you with mo. records of quantity & volume
- Use conversion #s if needed





## Step 9 Adjust

# Step 10 - Celebrate Success

- Worker thank you lunch
- Press
- Events
- Certificates
- Drawings
- Other





Questions?

Thank You!

# Contact Information

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