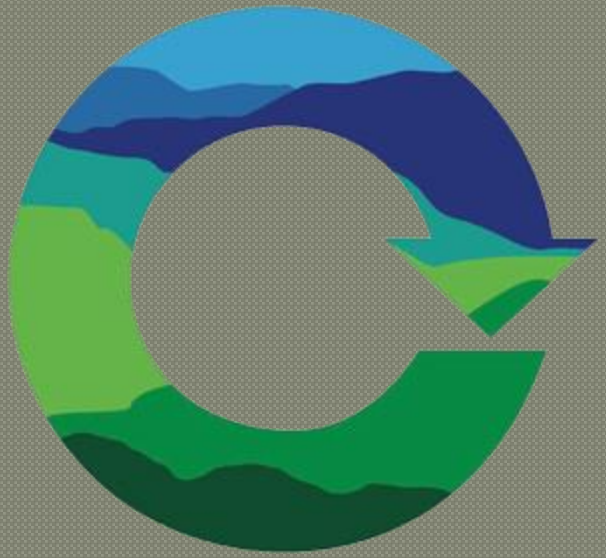
ZWTL 101

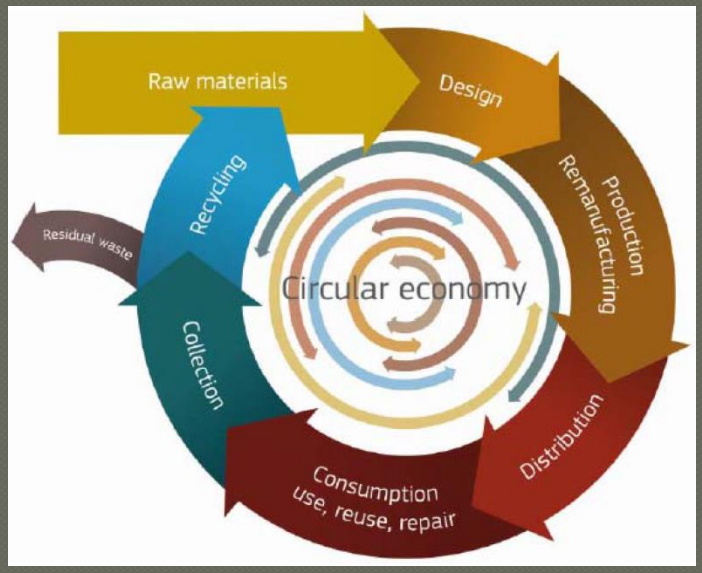
Zero Waste to Landfill
Or….
As Much is Economical and Practical



- Zero Waste to Landfill
  - What is it?, benefits, how to get started
- Basic Elements of a Successful Waste Reduction Program
- Tips for Success
  - Reduce, reuse, recycle, compost, etc
  - Working with service providers

What is ZWTL?

- Landfill avoidance
  - Through waste reduction
  - Through recycling
  - Through composting or anaerobic digestion
  - Through waste to energy



Should we strive for ZWTL?

- We encourage as much waste reduction as is economical and practical
- Each facility must make its own decision
- The benefits:
  - Efficiency – maximizing LEAN manufacturing practices
  - Reducing material going to community landfills
  - Saving landfill tipping fees
  - Attractive to customers and business partners

Zero Waste Facilities in NC

- AW North Carolina, Inc (Durham)
- Bridgestone Americas Tire Operations (Wilson)
- Burt's Bees (Durham)
- Daimler Trucks North America (Cleveland, Gastonia, Mt. Holly)
- Eaton Corporation (Raleigh)
- Firestone Fibers (Gastonia, Kings Mountain)
- Glen Raven (Burnsville)
- Greif (Charlotte)
- Highland Industries (Kernersville)
- Honda (Swepsonville)
- Ingersol Rand (Mocksville)
- Jackson Paper (Sylva)
- Keihin Carolina System Technology (Tarboro)
- Leggett & Platt (High Point)
- MillerCoors (Eden)
- Santa Fe Natural Tobacco Company (Oxford)
- Thermo Fisher Scientific (Asheville)
- Thomas Built Buses (High Point)
- Unifi (All NC sites)
- Unilever (Raeford)

Getting Started

- Get buy–in from upper management
  - Or clarify a goal coming from upper management
- Develop a team that will decide the answers to these questions:
  - Manufacturing waste only?
  - Total site?
  - Willing to use WTE?
  - Does it have to be cost neutral?
- Carefully develop and launch a program
- Implement the basic components of a successful waste reduction program

Basic Components of a Successful Waste Reduction Program

Basic Components

- Lasting support from management
- Active green team
- Ongoing education and promotion
- Tracking system
- Ongoing assessment of the program
  - composition of your waste stream
  - opportunities for diversion
- Review and improve
- Report results

Basic Components

- Stay focused on LEAN manufacturing
- LEAN: waste reduction = plant efficiency

Green Team (or team by another name)

- Importance of a team
- With an on-site champion to lead
- Include staff from all levels and different departments
- Permitted to spend work time on tracking & educational ideas
- Team can work on ways to get employee buy-in

CASE STUDIES IN
WASTE REDUCTION

Establishing a Green Team - Ideas and Resources

One of the key elements for consistent and sustained waste reduction at any facility is the establishment an active and lasting "green team." This team could be called by another name: "waste reduction team, sustainability team, continuous improvement team, etc." They should have the ability to meet and work on team projects during company time.

A green team should be led by one main individual but made up of personnel from a variety of departments, to work on waste reduction projects.

Empower this team to track metrics, report progress of the waste reduction programs, develop creative ideas for employee engagement, and perform annual continuous improvement analysis of the efficiency of the flow of

Why a green team?

- **Tool for getting buy-in from employees**
- **Education of employees**
- **Implementation champions**

Who to involve?

A cross-section of entire employee base:

- **EHS**

Tracking

- Setting Baselines
  - Solid waste vendor cost and total weight
    - solid waste hauler tickets and hazardous waste bills of lading
  - Number and size of solid waste dumpsters
  - Frequency of dumpster collection

- Metrics & Measurement
  - Monthly tracking of cost and weight
  - Remember that construction projects and clean outs of storage areas can cause spikes
  - Consider normalizing data to production for management
    - lbs of waste per widget produced

What is in Your Waste

- Waste Assessment
  - Facility walk-through; look in trash cans, dumpsters and recycling bins; visually observe; estimate amounts and types of waste

- Waste Audit
  - Sort through a representative sampling of waste (e.g. day's worth); measure and record categories

- Dumpster Dive
  - Sort the entire dumpster ; requires thorough organization; valuable data; valuable educational opportunity

Dumpster Dive

Source:
ThermoFisher Scientific, Asheville NC

Dumpster Dive

Sources:
Herbalife, Winston Salem
Highland Brewing, Asheville

Dumpster Dive Best Management Practices

Accepting the Zero Waste-To-Landfill Challenge

Performing an audit of your business's waste stream, aka a "dumpster dive" or "waste sort," is crucial to understanding where your opportunities for waste reduction lie. There are many ways an audit can be performed. Businesses can choose to pull out random, representative samples of the waste stream in order to categorize and measure the main components. Or, a business may choose to go the extra mile and perform a more comprehensive audit of its waste. There are advantages to making the additional effort to analyze the entire contents of a company's solid waste dumpsters. Not only do these waste sorts identify what is currently in the waste stream, but these events can be used to educate employees on the company's waste reduction goals and to determine the effectiveness of the recycling program.

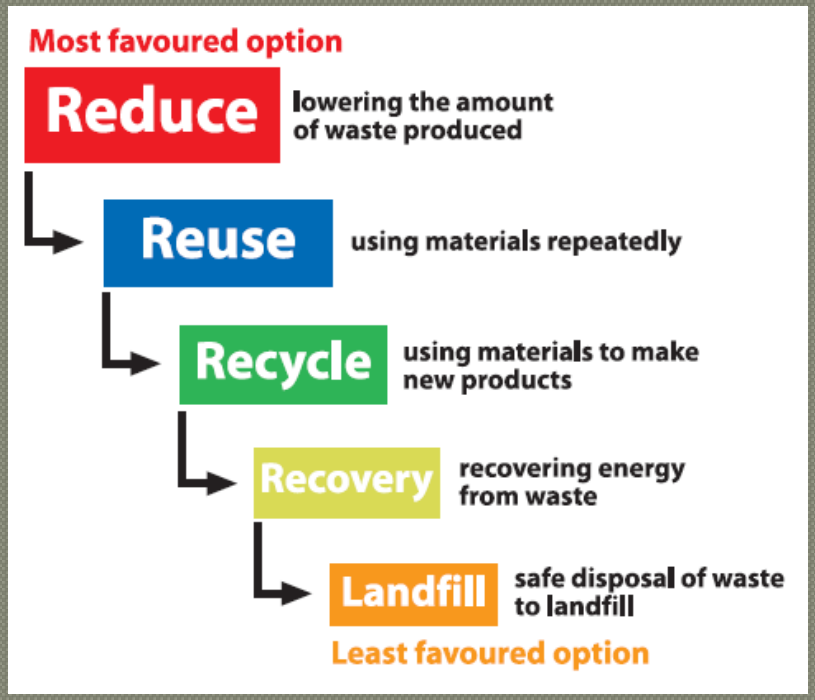
Dumpster Dive

- Be sure to hire your waste hauler to clean up at the end of the event

Basic Components Cont…

- Review and improve
- Report results

Tips for Success



Overall Goals

- Avoid, reduce, reuse… then recycle and compost
- Make waste reduction/recycling/composting as simple and as convenient as possible
  - ***Having a program that is streamlined and standardized helps to achieve that***
- Nurture your relationship with your service providers
  - ***Choose wisely; effectively communicate; maintain quality standards***
- Adjust waste collection service to reap savings

LEAN + Green

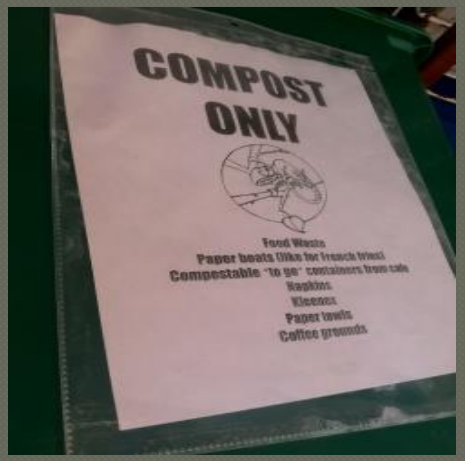
- Avoid generating waste in the first place
  - Can trimmed edges/paint overspray be avoided, reduced or reused with better equipment?
  - Can cardboard scrap generated in one area of the facility be reused in another area of facility?
- Returnable dunnage, reuse loops w/ suppliers
  - Boxes, crates, drums, spools
  - Work with customers and suppliers
  - Involve procurement
- Big potential for cost savings

Examples

- TE Conductivity
  - Implemented a formal process with suppliers for cardboard boxes to be backhauled and reused a certain number of times
- Thomas Built Buses
  - Designed special metal rack for windshields to replace wooden crates – more durable, less waste, less windshield damage, more savings $
- EMC
  - Developed special carts to move parts around to avoid packing in one area of plant and unpacking in another
- John Deere
  - Replaced its wooden shipping crates with returnable metal crates. This reduced shipping damage on their turf care equipment and helped the company cut back on its wood usage by more than 5 million feet of wood each year. The result was a $400,000 per year savings in reduced material costs each year.

Other Strategies

- Can the material be donated?
- Is there a recycling market?
- Is there a composting or anaerobic digestion facility nearby?
  - Cafeteria waste, untreated wood waste, paper towels, inert/organic by-products
- Waste to energy
  - Sometimes costly, depending on BTU value and distance to facility
- All in one ZWTL service providers



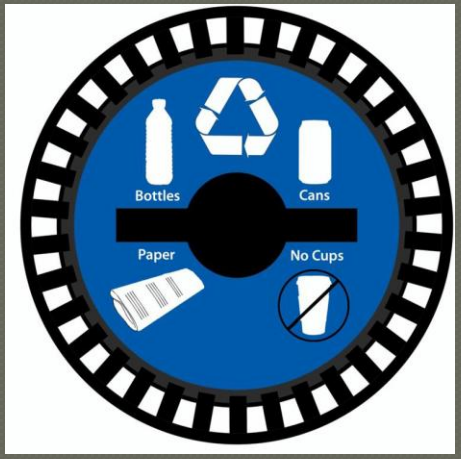
Container Standardization

- Be consistent with choice of container style and color throughout the facility
- If you still have trash containers,
  - Place recycling and trash side by side so that it is just as easy to recycle.
  - Make sure recycling and trash containers look very different from each other so that it is easy to distinguish what goes where.

Sources:
Meritor, Fletcher NC
Freightliner, Gaffney SC

More about Containers

- Strategically place containers as close to where the scrap is generated as possible
- Keep containers tidy
- Bins with restrictive openings can be effective



Signage = Very Important

- Clear, easy to read, eye level
- More graphics , less words
- It is better to say what can go in the container vs. what cannot
- If you want to indicate what cannot go in the container use a red slash
- Be consistent with signage throughout the facility
- Replace as soon as it is no longer tidy

Source:
Vanguard Furniture,
Conover NC


LANDFILL
COMPOST
COMPOST
TWIX
Sun Chips
Fritos
UTENSILS HERE
NO UTENSILS HERE
NO UTENSILS HERE
LANDFILL
COMPOST
COMPOST


DENIM APRONS ONLY
DENIM APRONS ONLY

Strategies for Collecting Film

Service Providers

- Choose wisely
  - How long have they been in business?
  - Ask for references
  - Require certificates of recycling
  - Can they supply containers?
  - Can you adjust service without penalty?
  - Can they give you reports on volumes or weights recycled?

Fact Sheet: Working with Recycling Vendors

N.C. Division of Environmental Assistance and Customer Service

Customer service through no cost technical, compliance and financial assistance

Working with Recycling Vendors

Finding the right vendor for your recyclables requires a little bit of diligence and knowledge of your waste streams, storage capabilities and resources. The reality is that you may need more than one recycling vendor, and they are interested in large quantities on a regular schedule. To save yourself time and space, you can aim for mixed loads of recyclables. Separating recyclables takes employee time and containers.

Consider the following options before researching recycling options,

- Can you change the material you are using?
- Can you change the packaging to be reusable or reduce the amount of packaging?
- Can you begin a take-back program with the vendor?
- Is your packaging recyclable?
- Is your waste a resource for someone else?

Research what you have in place presently,

- When does your trash contract expire?
- Are the charges correct?
- Is the number of tips correct?
- Are the number and size of dumpsters correct?
- Are they "dumping air"?
- Are you paying more than one trash company?
- When is the last time you compared pricing?

Recycling Vendors

Clearly Communicate with Recyclers

- Have volume estimates and pictures
  - *For example, share pictures from your dumpster dive*
- Send a test batch to recycler/buyer
- Discuss potential for recycler /buyer to provide containers and baler, or other equipment to help condense or prepare recyclables for market

Pictures

- Pictures are critical:
  - For example, "wood waste" - is it shavings? is it pieces? is it particle board? is it sawdust?

Recycler's Goals vs. Your Goals

- Most recyclers want truckload quantities of a single material that they can ship direct to the end market
- However…you may have less than truckload volumes of diverse materials
- As ZWTL programs progress, the volumes of materials that you will need to recycle may shrink
  - Can recycler accept truckloads of mixed materials?
  - Do they have other ideas?
  - If scrap is from supplier packaging, can supplier backhaul and recycle that particular material from a variety of their customers?

Scrap Value

- Some scrap has value, some does not
- Value can be lost in transportation and processing costs
- To enhance your scrap value, your material has to consistently meet the recycler's quality standards
- Routinely and randomly spot check for contamination

Preventing contamination is the biggest challenge in recycling and the most important….especially now.

Recycling Markets

- Market prices for recyclable material fluctuate
- Current market pricing for recyclables is not ideal
- The trick:
  - *Position your program to take advantage of market upswings, but be prepared to weather the down times too.*

The Real Value = Down Sizing Waste Containers

- Routinely examine external dumpsters serviced by waste haulers
- Are they less than full on collection day?
- If so, reduce container size or collection frequency
- This should save money
  - *Make sure contract doesn't penalize you for changes*
- Review hauling contract language and actual bills regularly to make sure charges are accurate

Last but not Least

- Keep track of savings!
  - Avoided costs, reduced hauling charges, recycling revenues, etc.
- *So that you can show that the time and effort that goes into your waste reduction program pays off.*

North Carolina Resources

- NC Environmental Stewardship Initiative
- North Carolina Recycling Markets Directory
- Waste Reduction Partners
- Composting Organics Recycling
- North Carolina WasteTrader

Thank you!

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