



ZERO WASTE TO LANDFILL 101

A Beginners Workshop

THE TEAM

Presenters

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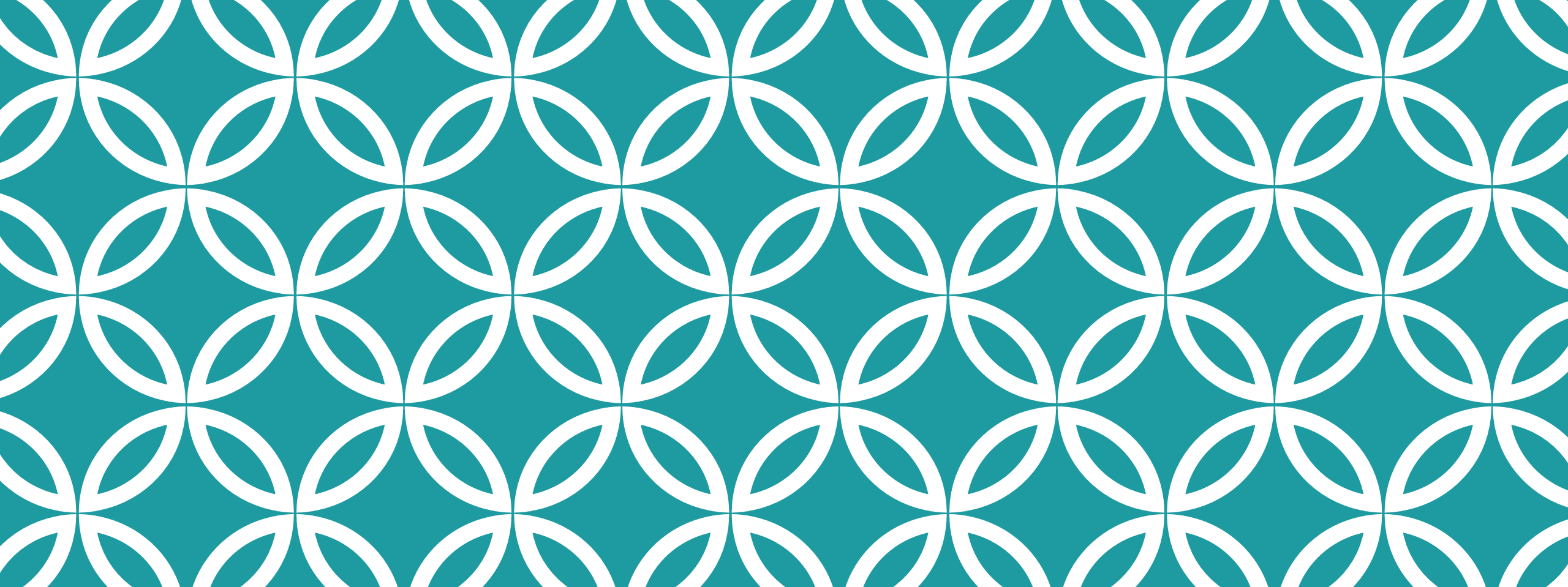
Moderators

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OVERVIEW

- Getting Started
- Defining the Goal
- Green Teams
- Dumpster Dives (Waste Audits)
- Tracking Progress
- Tips & Tricks
- Resources



GETTING STARTED



GETTING STARTED

- Landfill Bans
 - North Carolina General Statute 130A-309.10(f)-(m)
 - Aluminum Cans
 - Plastic Bottles
 - ABC Containers
 - Recyclable rigid plastic containers that have a neck smaller than the body (except for motor oil or pesticides)
 - Wooden Pallets
 - Used Oil
 - Motor Vehicle Oil Filters
 - Antifreeze
 - South Carolina Banned Items
 - Appliances
 - Electronics (i.e., computers, monitors, printers, televisions)
 - Lead-acid batteries
 - Yard Waste
 - Whole Scrap Tires
 - Lead Acid Batteries
 - Oyster Shells
 - Computer Equipment & Televisions
 - White Goods
 - Mercury-Containing Thermostats
 - Used motor oil
 - Whole waste tires

WHAT IS ZERO WASTE?

What is your definition?



ZERO WASTE-TO-LANDFILL

No material from your facility is going to the landfill.



ZERO WASTE INTERNATIONAL ALLIANCE

"Zero Waste is a goal... 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."

<http://zwia.org>

WHY SHOULD I GO ZERO WASTE?

- Reduces material going to the landfill.
- Makes your facility more efficient and environmentally friendly.
- Removes landfill costs.
- BETTER FOR THE ENVIRONMENT

DEFINING THE GOAL

➤ Getting buy in from upper management

OR

➤ Clarifying a goal given by upper management

- Manufacturing Waste Only or Total Site or Other?
- Does Zero mean 100% or some other percentage?
- What support is in place?
- Willing to use WTE?
- Does goal have to be cost neutral?

HOW DO I GO ZERO WASTE TO LANDFILL?

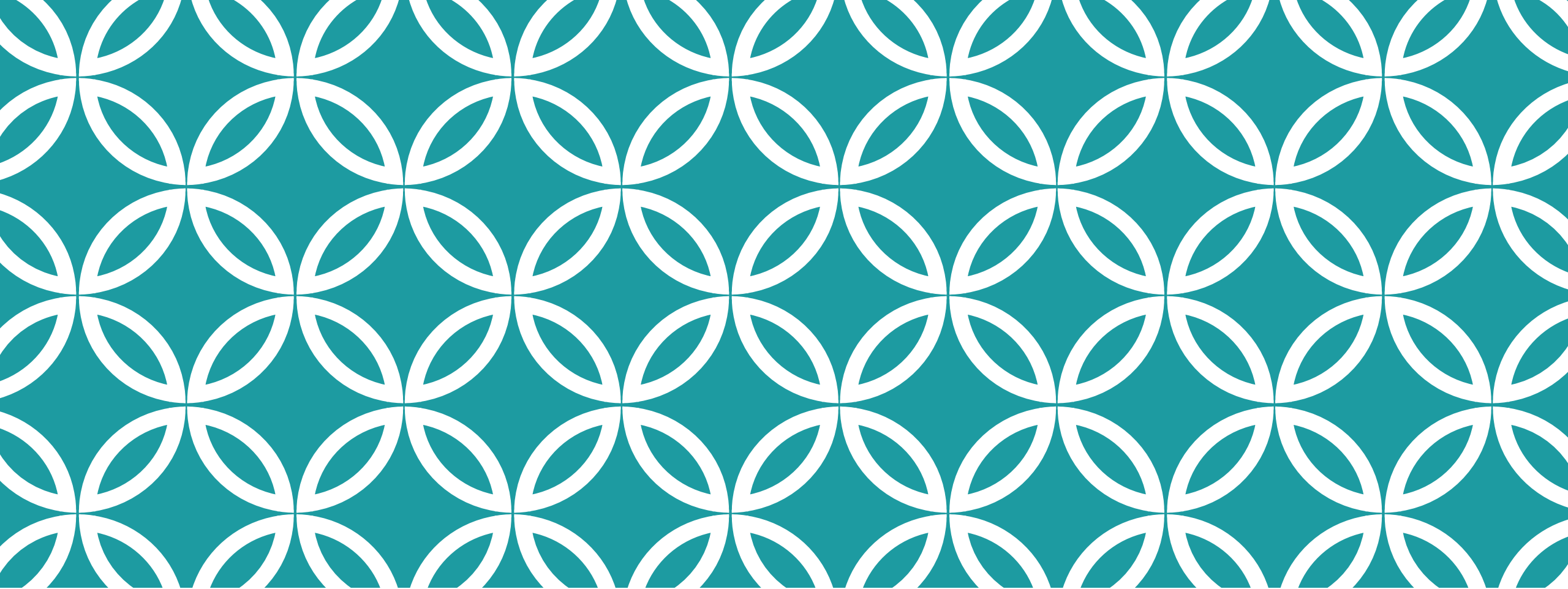
- Management support
- Green Team
- Baseline
- Assessment
- Develop a program
- Educate and promote
- Launch
- Review and improve
- Report?

THINGS YOU CAN DO TO GO ZERO WASTE TO LANDFILL

- Dumpster Dive
- Reusable packaging
- Organics
- Partner
- By-products

GREEN TEAMS

- Why?
 - Tool for getting buy-in from employees
 - Education of employees
 - Implementation Champions
- Who?
 - Cross-section of entire employee base
 - EHS
 - Maintenance/Facilities
 - Production (not just supervisors)
 - Janitorial
 - Purchasing/Supply Chain
 - Shipping
 - Office
 - On-site vendors
- Idea Generation Methods
 - Team discussions
 - Suggestion box
 - Reward systems
 - Performance Management Requirements
 - Benchmarking achievers
 - Talk to your vendors
 - Share ideas with sister sites



DUMPSTER DIVES

Waste Audits

TWO OPTIONS

Waste Assessment

Waste Audit

WASTE ASSESSMENT

- Facility walk-through.
- Look in trash cans, dumpsters and recycling bins.
- Visual observation.
- Estimate amounts and types of waste.



WASTE ASSESSMENT

- While walking through the facility note:
 - Layout and operations;
 - Types and amounts of waste;
 - Inefficiencies generating excess waste;
 - Existing waste and recycling equipment; and
 - Current waste reduction and recycling efforts.

WASTE AUDIT

- Sort a day of landfill waste.
- Physical collection, sorting and weighing.
- Establishes a baseline.



WASTE AUDIT

- Examine current waste reduction and recycling practices.
- Identify potential waste reduction and recycling options.
- Can focus on entire business or certain areas.
- Ensure waste sorted is from a typical day.

WASTE AUDIT SUPPLIES

- Rubber gloves
- Cardboard boxes
- Scale
- Camera
- Plastic trash bags
- Broom/shovel and dustpan
- Clipboard, pens/markers
- First aid kit
- Plastic sheeting/drop cloth

*Wear old clothes, long pants, long sleeves and closed toe shoes.

WASTE AUDIT

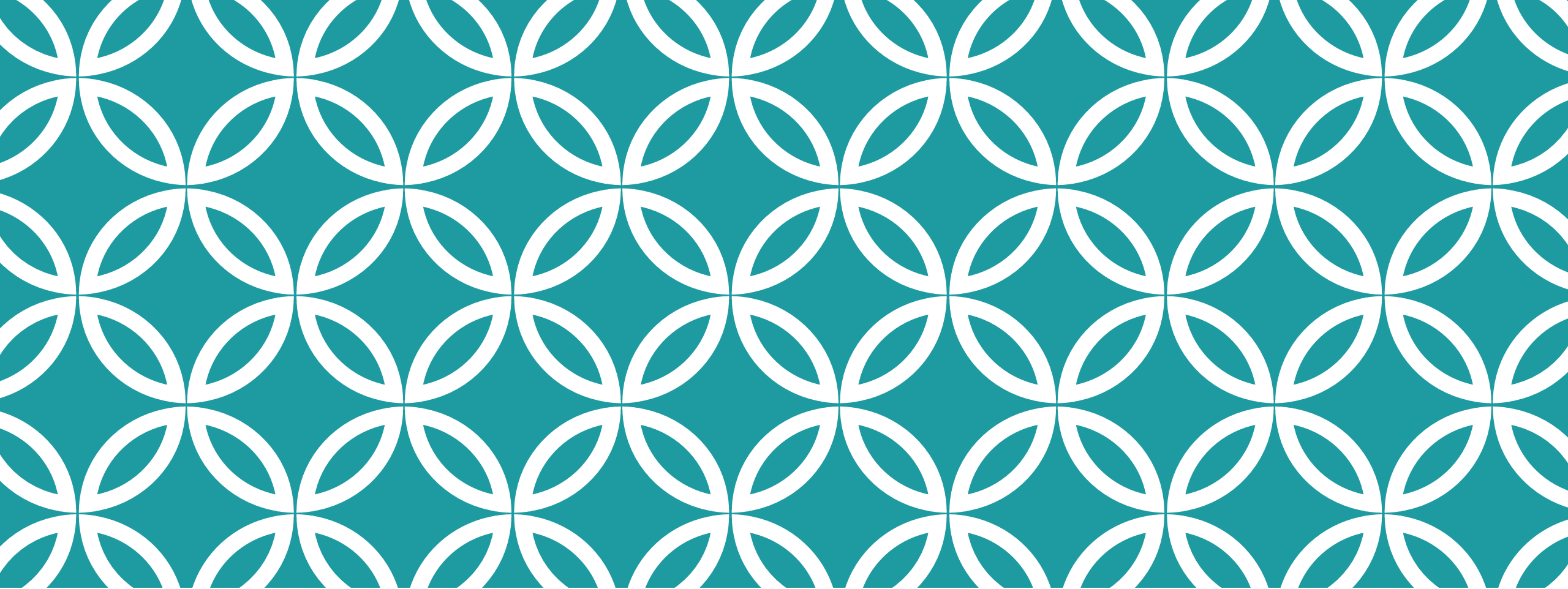
- The sort...
 - Determine size and location of waste sort area;
 - Work with building management;
 - Assemble waste to be sorted;
 - Conduct audit with minimal disruption to other employees;
 - Sort and weigh contents of each waste stream; and
 - Calculate percentages by material type.

WASTE AUDIT

- The sample sort...
 - Obtain representative samples of waste.
 - Sort waste by material type.
 - Evaluate quality of material collected.
 - Weigh each category.
 - Obtain information on amount of waste disposed over the sample period.

AFTER THE AUDIT OR ASSESSMENT

- Get the facts – what can be reduced, reused or recycled.
- Involve staff – audit/assessment is educational and involves staff in decisions about reducing waste.
- Plan thoroughly – prioritize waste stream components.
- Determine costs – the cost of the current waste and recycling program.
- Focus on results – record-keeping system.



TRACKING PROGRESS



TRACKING PROGRESS

❖ Setting Baselines

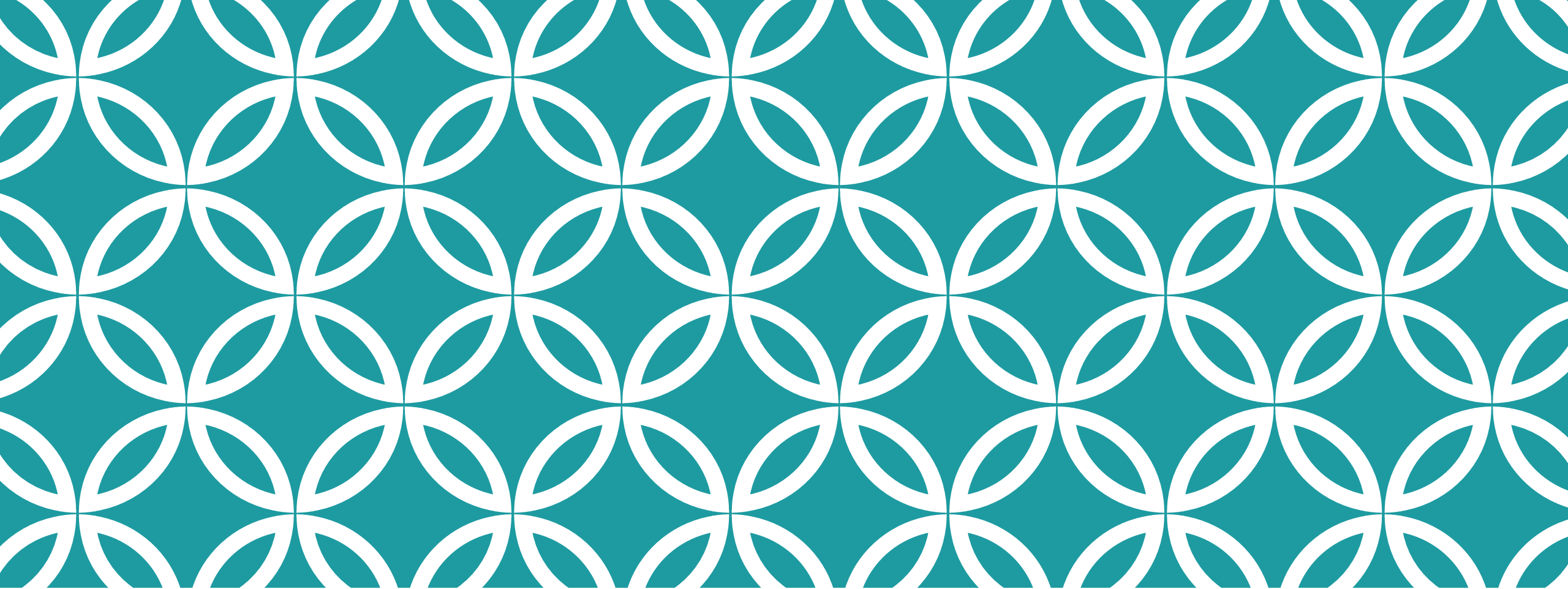
- ❖ Dumpster pulls
- ❖ Solid waste vendor weights
- ❖ Use full year of data if possible

❖ Metrics & Measurement

- ❖ Weight to landfill (hauler should have this info for each dumpster pull)
- ❖ Weight of hazardous waste disposal (bills of lading)
- ❖ 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
- ❖ May also track tons of recycling, composting, land application (organic liquids), filtration and reuse of liquids
- ❖ Right size/time dumpster pulls and dumpster size (pull only when needed vs on regular schedule)

❖ Using a full-service vendor or sourcing options internally

❖ Single Stream vs Separating Materials



TIPS AND TRICKS



OVERALL GOALS

LEAN (avoid, reduce, reuse)... then recycle

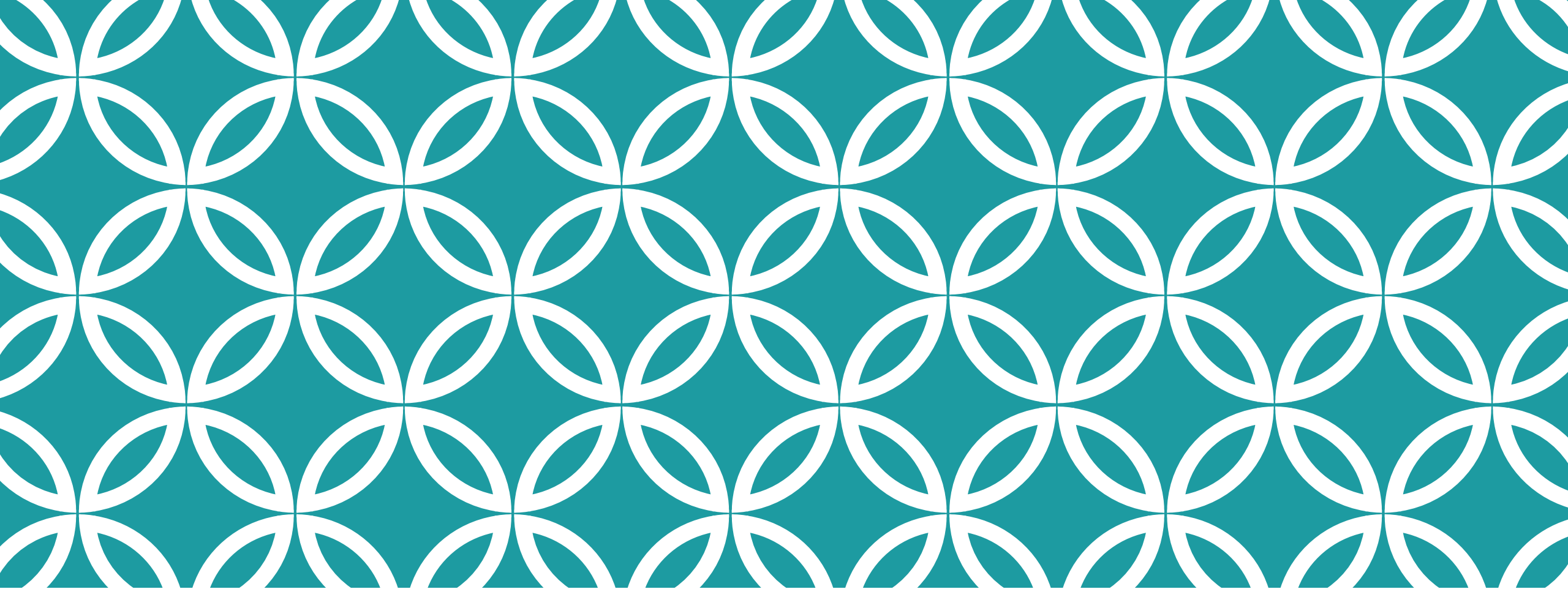
Make recycling and waste reduction as simple and as convenient as possible

- *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 TIPS AND TRICKS

Avoid, Reduce, Reuse

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 vendors.
- Involve procurement.

Big potential for cost savings



SC EXAMPLES

Caterpillar Inc.

- Worked with suppliers to return packaging including wood pallets and crates and implemented a new electronic procurement system to reduce paper usage. As a result of these and other waste reduction initiatives, Caterpillar saved \$406,000 in project costs.

CCL Label

- Reduces packaging waste by requesting cores from its suppliers that can be reused and ensure products are delivered in reusable plastic shipping containers. By using returnable containers, the company saves 25,000 cartons each year.

Timken Company

- Pallets are back shipped to suppliers, plants and the warehouse and MBA packaging is reused instead of recycled. This initiative saved the facility \$140,354 in avoided costs.

Mitsubishi Polyester Film, Inc.

- Post-industrial polyethylene terephthalate (PET) liners are collected from customers and returned to the site to be converted into resin for use in the PET film manufacturing process.

NC EXAMPLES

TE Connectivity

- Implemented a formal process with supplies 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 a 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.

SUCCESS STORY

HONDA OF SOUTH CAROLINA

Zero Waste to Landfill July 2010.

First move = logistics began to stress returnable packaging.

Recycle plastic, cardboard, metal, rubber and paper.

Styrofoam condenser.

Filter cake to fuels blender.

Revenue - \$60,000 in 2013.

Disposal cost decrease - \$2,000 per year.





TIPS AND TRICKS FOR RECYCLING THE REST

Streamline and Standardize
Your Recycling Program

CONTAINER STANDARDIZATION

Be consistent with choice of container style and color throughout 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.



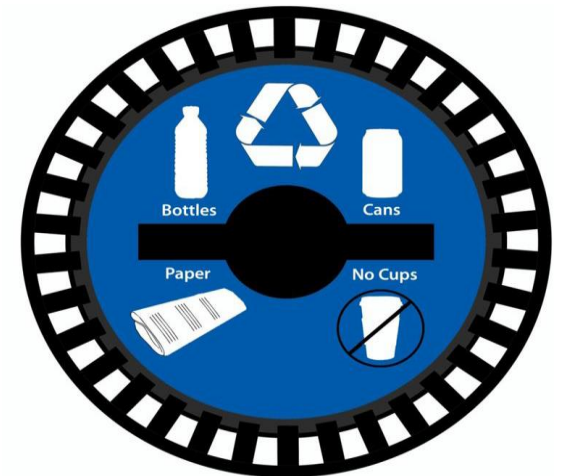




MORE ABOUT CONTAINERS



- 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 fresh / tidy





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?

MIXED RECYCLING — AKA “SINGLE STREAM”



- Seek vendors who can offer as much co-mingled collection as possible
 - Example- collect bottles / cans / office paper in the same container
 - Materials like metals, wood, and textiles would typically need to be separated

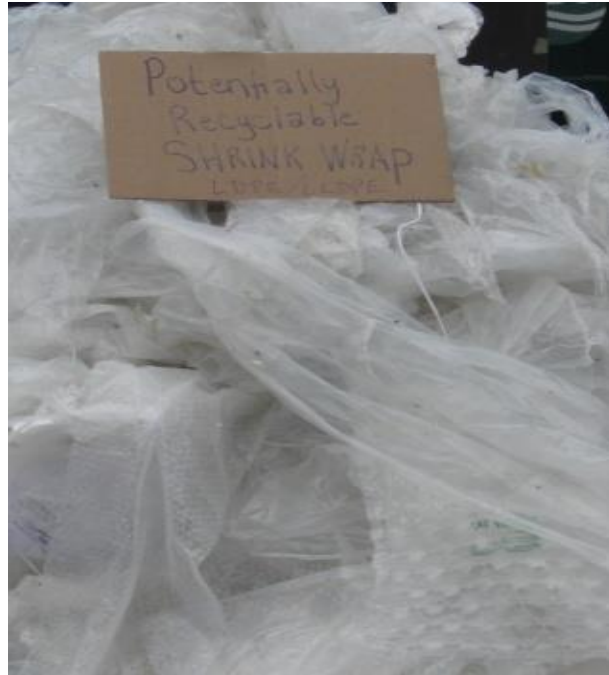
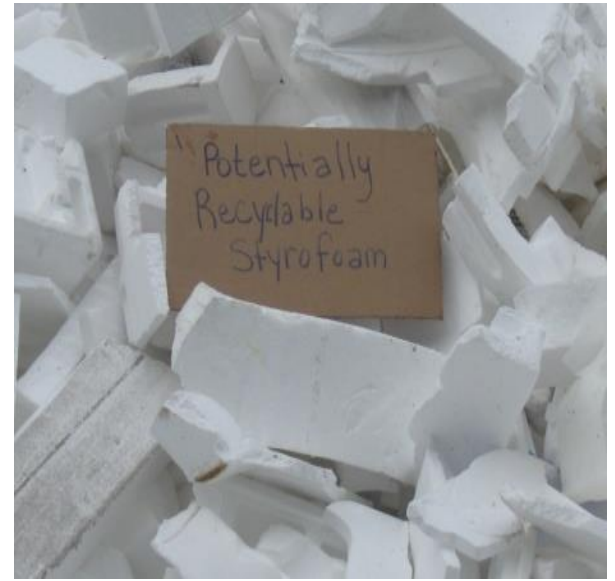
CLEARLY COMMUNICATE WITH RECYCLERS

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 will 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

Some items have costs associated with their processing

To enhance your scrap value, your material has to consistently meet the recycler's quality standards

Routinely and randomly spot check for contamination

RECYCLING MARKETS

- Market prices for recyclable material fluctuate
- Current market pricing for recyclables is at record low
- Expect current price picture to last at least two years, maybe longer.
- 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*

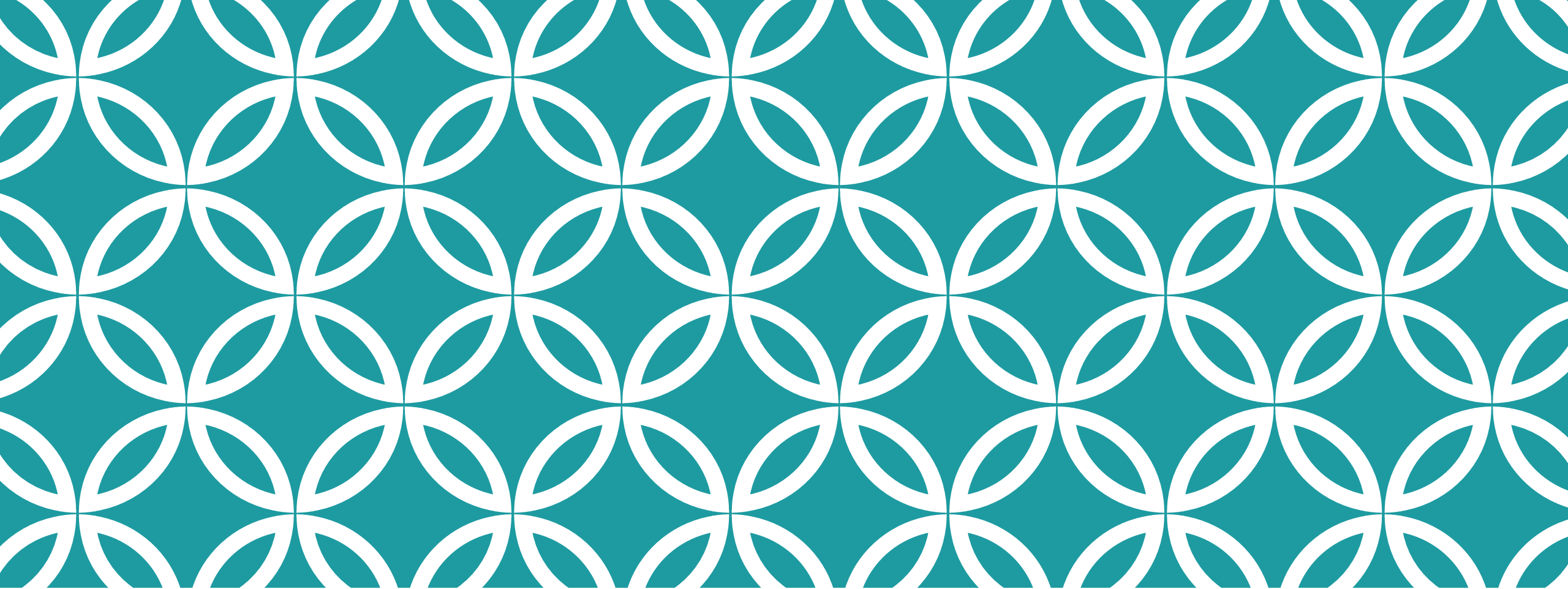
Review hauling contract language and actual bills regularly to make sure charges are accurate

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.



WHAT'S LEFT?

- Organics/Food Waste
- Waste to Energy
- Creative Reuse

ORGANICS

- Compost on-site, use on-site.
- Send to a composting facility.
- Food composting regulations
- Donate food to a local charity.



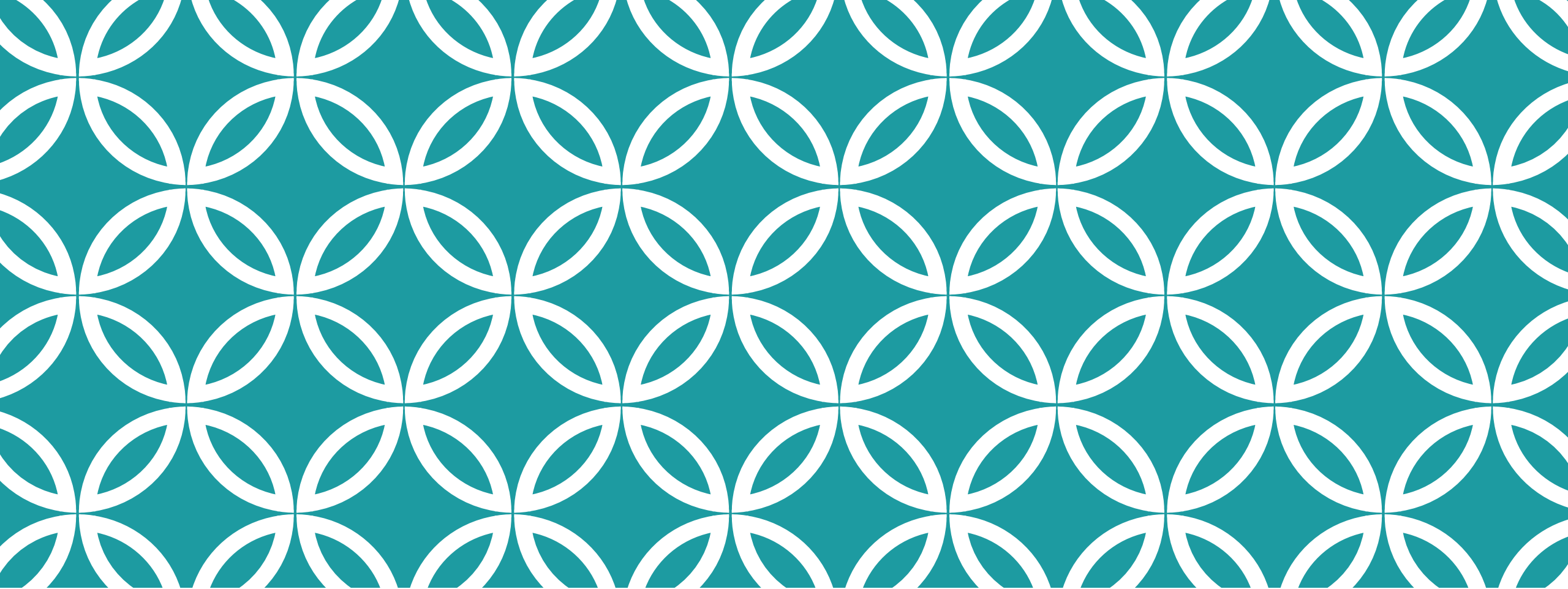
PROCESS BY-PRODUCTS

- Reprocess.
- Return to the manufacturer.
- Fuel blending.

PARTNER WITH BUSINESSES

- Not enough material? Ask your neighbor for help.
- Combine materials or work together with a recycling company.





RESOURCES



NORTH CAROLINA RESOURCES

- ZWTL Website

<http://deq.nc.gov/about/divisions/environmental-assistance-customer-service/deacs-conservation/zero-waste>

- Environmental Stewardship Initiative

<http://www.ncesi.org>



- Waste Reduction Partners

<http://wastereductionpartners.org>



Waste Reduction Partners

- NC Banned Material Info

<http://deq.nc.gov/conservation/recycling/banned-materials>

- Recycling Markets Directory

<http://www.p2pays.org/DMRM/start.aspx>



- WasteTrader

<http://www.ncwastetrader.org/>



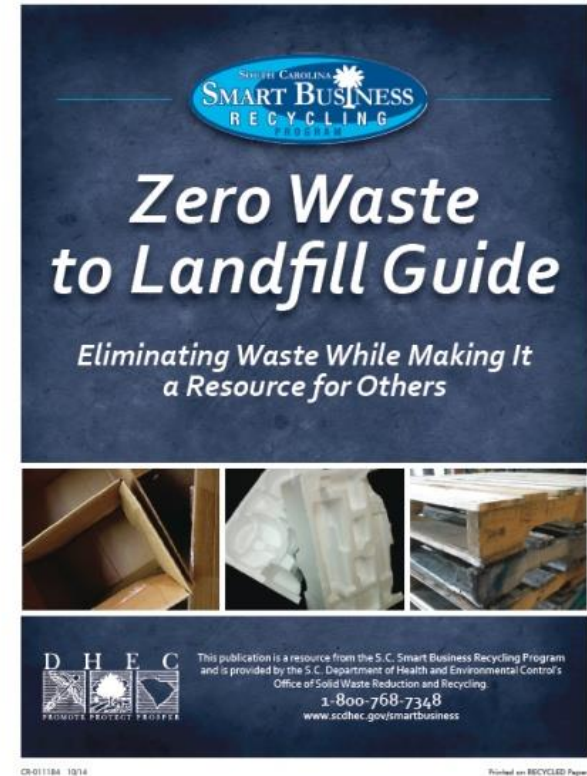
- Composting/Organics

<http://deq.nc.gov/conservation/recycling/composting>



SOUTH CAROLINA RESOURCES

- Smart Business Recycling Program – www.scdhec.gov/smartbusiness
- Green Resource Index
- Recycling Business Directory – www.recyclinginsc.com/directory
- S.C. Materials Exchange – www.scdhec.gov/scme
- Tip Sheets, Best Management Practices
- Smart Business Guide to Waste Reduction and Recycling
- Zero Waste to Landfill Guide
- Site Visits



FOR MORE INFORMATION IN SC:

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