



A professional organization of members  
working together to drive  
environmentally friendly manufacturing

**[www.sustainablemfr.com](http://www.sustainablemfr.com)**

**Kate Bachman, Editor**

Carolina Recycling Association  
Manufacturers Zero Waste conference

A photograph of a large pile of garbage at a landfill. The trash is dark and messy, with some pieces of plastic and paper visible. A thick plume of white smoke or steam is rising from the left side of the pile, partially obscuring the background. The lighting is bright, suggesting daylight.

# I. Landfill Factoids



# Landfill Factoids

## **Sources:**

- **“Things You Might Not Wanna Know About Trash and Landfills”)  
© 2009 Planet Green.com, a Discovery co.**
- **CNBC “The Secret Life of Garbage”**
- **NPR**
- **U.S. Environmental Protection Agency website**



# Landfill Factoids

1. Average human = **1,500 pounds of garbage / year** (4.5 lbs. / day) --  
1,200 pounds is organic waste
2. **No one produces more trash than the U.S. (2009)**  
5% of the world's people [generate](#)  
40% of the world's waste
3. In 2013, **Americans generated about 254 million tons of trash.** We  
recycled and composted about 87 million tons of this material  
= 34.3 % recycling rate. (US EPA; 2013)
4. In **NYC**, [25,000 tons of municipal solid waste](#) generated / day (2009)





# Landfill Factoids

## 5. Annually, [America's landfills](#) become home to

- 1,600,000,000 pens
- 2,000,000,000 razor blades
- 2,548,000,000 disposable diapers
- 220,000,000 car tires \*

## 6. The average baby uses [6,000 diapers](#)

- 49 million disposable diapers / day in the U.S.
- 200 to 500 years to decompose

## [7. Decomposition times](#) vary widely.

Banana peels 2-10 days

Cotton: 1-5 months

Aluminum cans: 80-100 years

Glass bottles: 1,000,000 years



# Landfill Factoids

**8. Largest** — America's largest landfill, **Puente Hills Landfill**, LA 50 years in operation, the landfill grew higher than 500 feet. Closed in 2014. Highest, 6th largest landfill --Mount Rumpke," [Rumpke sanitary landfill](#) in Hamilton County, Ohio towers 1,075 ft. above sea level; 230 acres

**9. Landfills [release gases](#)**, primarily carbon dioxide, methane, and carbon monoxide. However, "landfill gas" is a potential [source of alternative energy](#); natural gas for electricity, heat in managed landfills.

**10. The U.S. has a LOT of landfills!**

- 1,794 landfills (Planet Green; Discovery, 2009)
- 3,091 active landfills and over 10,000 old municipal landfills, according to Zero Waste America, citing the Environmental Protection Agency

II. Why are landfills a focus of manufacturers' efforts?

Why focus on landfills?

## Landfill Trends

1. They are filling up
2. Some are closing
3. Some states have placed a moratorium on new landfills
4. Increased disposal, transportation costs



Why focus on landfills?

## 5. Geographic stigma:

- “We don’t want another state dumping its garbage in ours”
- “We’ve become the pay toilet of the nation”

## 6. Toxic waste into water table?

## 7. Gas leachate = GHG emissions

Why focus on landfills?

8. Wasted resources

“Waste is just poor design”

9. Managing waste well = eco-responsible

10. Humankind is affecting the  
environment--cumulative effect

### III. What can manufacturers do?

What can manufacturers do?

**What are manufacturers doing?**

So, what can manufacturers do?

**Go For Zero!**

**zero landfill, zero waste**



# Manufacturers going zero

You're trending!

#zerolandfill

#zerowaste

#zwl

#ZWTL

#landfillfree

Manufacturers going zero

You're in good company

More than half of FORTUNE® 500 companies  
have waste reduction goals

37 of FORTUNE® 500 have zero waste-to  
landfill goals

Manufacturers going zero

You're in good company

Manufacturers that have achieved zero landfill,  
virtually zero landfill, or have zero landfill goals

ABB

Abus hardware/ABUS Hardware (Shenzhen)

Aviva

Bridgestone Americas Wilson NC

Burt's Bees

Crown Lift Trucks

Daimler

Freightliner Custom Chassis Corp.

GAF Material/TPO Plant

GAF Material/EverguardTPO Plant

# Manufacturers that have achieved zero landfill, virtually zero landfill, or have zero landfill goals

General Motors

GlaxoSmithKline

Haworth

Honda

Hypertherm

Kroger manufacturing plants

Landfill Forms

Mayer Brothers / West Seneca NY plant

National Office Furniture, a division of Kimball International

Nestle

Northrup Grumman

# Manufacturers that have achieved zero landfill, virtually zero landfill, or have zero landfill goals

Purdy Professional Paint Products

RB, London, zero waste to landfill in Europe, North America

Schick, Milford, CT

Shiloh Industries

Starbucks Coffee; York Roasting Plant

Panasonic

Subaru

SunPower®, Mexicali, Mexico

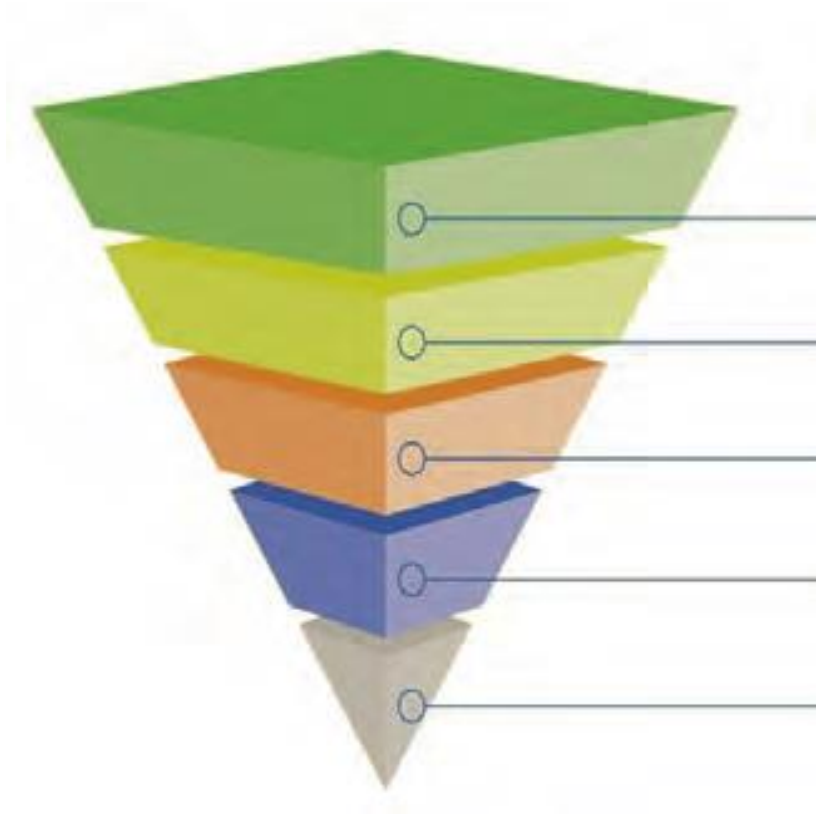
Toyota

Unilever



# IV. Go For Zero! How?

zero landfill, zero waste



- ✓ Reduce
- ✓ Reuse
- ✓ Recycle
- ✓ Compost
- ✓ Recover energy-from-waste

# Go For Zero! How?

## 1. Source reduction

Engineer to reduce waste generated

Go For Zero! How?

## 2. Reuse



FCCC uses reusable, returnable metal racking



Honda of South Carolina Mfg.  
returnable, reusable metal crates

# Go For Zero! How?

## 3. Recycle



In-plant sorting system\_  
Purdy Professional Products,  
Sherwin-Williams



Segregate waste for collection\_FCCC



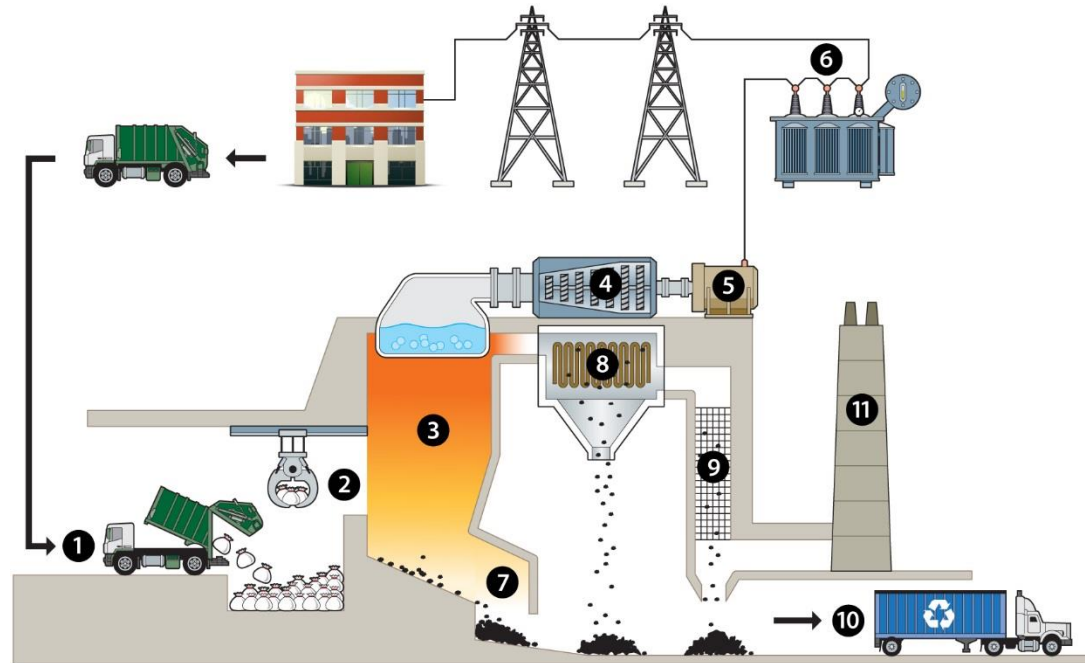
Go For Zero! How?  
4. Compost





Go For Zero! How?

## 5. Recover energy from waste



- Combustion
- Biogas (food, farm animals)
  - Landfill Gas Capture
  - Aerobic Digesters

Go For Zero! How?

6. Cultivate zero waste culture  
(Cradle-to-cradle,  
Circular Economy)



Bridgestone's Tires4Ward

Go For Zero! How?



## 7. Use recycled content (create demand)

Ford's Repreve upholstery fabric , made  
from 100 percent recycled materials



Go For Zero! How?

## 8. Manufacture using recyclable materials



Frito Lay Recyclable Seasoning Bags

Dell's packaging  
-recycled content  
- recyclable





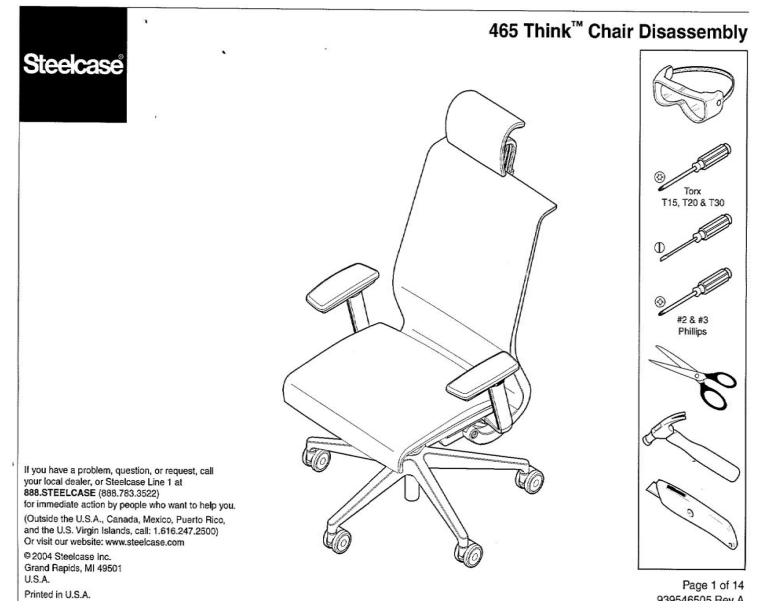
Go For Zero! How?

Get your  
materials  
categorized as  
recyclable  
(Dordan Mfg.)



Go For Zero! How?

## 9. Design for deconstruction or disassembly, reuse at end of life (Steelcase)



Go For Zero! How?

## 10. Set up takeback programs (Producer Responsibility)



PRODUCTS  
SOLUTIONS  
SUSTAINABILITY  
DISCOVER CROSSVILLE  
SMART SEARCH   
INSPIRATION   
RESOURCES 



Tile manufacturer Crossville, Crossville, Tenn., diverted 24 million lbs. of porcelain from landfills since launching its Tile Take-Back<sup>®</sup> program

Go For Zero! How?

## Manufacturers with Take Back programs

Anheuser-Busch – Reusable packaging

Apple –Computers

Bosch – Power Tools

Bridgestone – Tires

Dell – computers

Epson – Recycle Used Computer Hardware Products

Electronics & Computers Dell – Computers

Ford – Bumper Take-Back Project

Hewlett Packard – Electronics

IBM – Computers, Battery Packs, & Other Supplies

Kodak – Recyclable Cameras

Lexmark – Recycling Program for Ink Cartridges, Hardware

Motorola – Mobile Phones

Nokia – Mobile phones

Toshiba –laptops & MP3 players

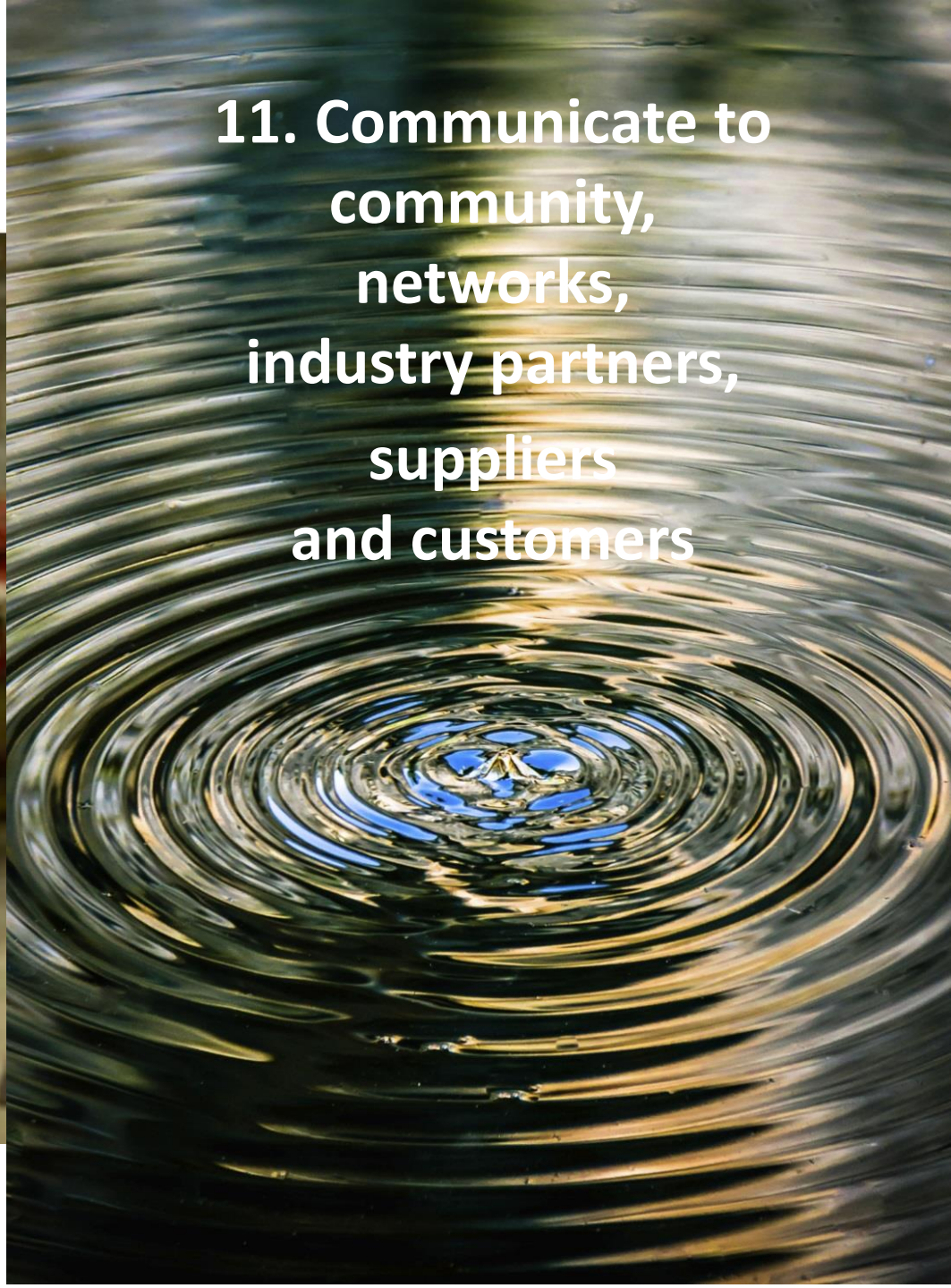
*<http://www.ccgov.org/uploads/PublicWorks/Landfill/Take%20Back%20Programs.pdf>*



Go For Zero! How?



**11. Communicate to  
community,  
networks,  
industry partners,  
suppliers  
and customers**



Go For Zero! How?

Communicate to **suppliers**



“We don’t want our suppliers giving us a black eye”-  
Roger Nielsen, Daimler Trucks NA



Go For Zero! How?



## 12. Give and receive support



Sustainable  
**manufacturer  
network**<sup>™</sup>

## V. What is Zero Waste?

## What is zero waste?

- Virtually zero waste to landfill
- Zero waste to landfill (plant)(EfW)
- Zero waste to landfill (entire facility)(EfW)
- Zero waste to landfill (entire facility, none to EfW)
- Zero emissions from waste
- Zero waste (none generated)



What is zero waste?

**Virtually zero waste to landfill**  
**95% waste diverted from landfill**  
**(Frito Lay, Beloit, WI)**



What is zero waste?



**Zero waste to landfill (factory)  
(Subaru—first to zwl in 2004)**

What is zero waste?



**Zero waste to landfill (entire facility)  
with 20% EfW facility**

**Crown Equipment**



What is zero waste?

# **Zero waste to landfill (entire facility)**

**“Zero means zero”**

**No waste to energy-from-  
waste facility**

**Purdy Professional Painting  
Products (Sherwin Williams)**



What is zero waste?



**Zero waste (none generated)**

**Burt's Bees; (goal)**

# VI. How to Prove?

How to set definitive target?

How to define, measure, quantify your zero goal?

How to relay to employees, create team approach?

How to establish reporting structure, process, protocol?

How to provide verifiable results to customers?

How to Prove?

# **Third-party Certifications**

How to Prove? Third-party Certifications

## **4 Certifying Organizations**

- UL Environment
- US Zero Waste Business Council
- Green Circle Certified
- NSF-ISR

Source: Jeff Gowdy, of J. Gowdy Consulting



## How to Prove? Third-party Certifications

- Documentation
- Plant audit
- Maintenance plan, recertification

## How to Prove? Third-party Certifications

# UL Environment

Zero Waste to  
Landfill (100%)

Virtually Zero Waste  
to Landfill ( $\geq 98\%$ )

Landfill Waste  
Diversion ( $\geq 80\%$ )

Reuse

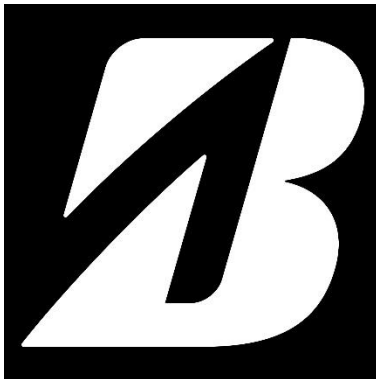
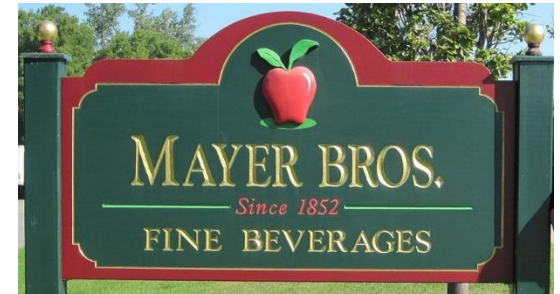
Recycle

Compost

Energy-from-waste  
(combustion and anaerobic)

How to Prove? Third-party Certifications

## UL Environment



How to Prove? Third-party Certifications

# US Zero Waste Business Council

90% Overall  
Diversion

Reuse

Recycle

Compost

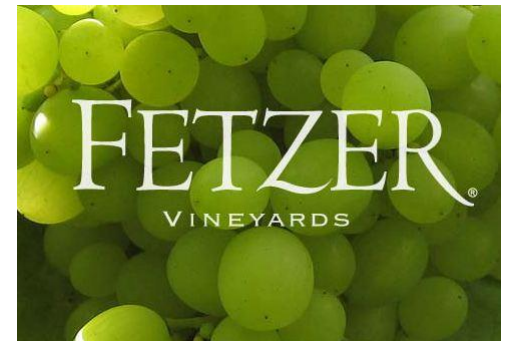
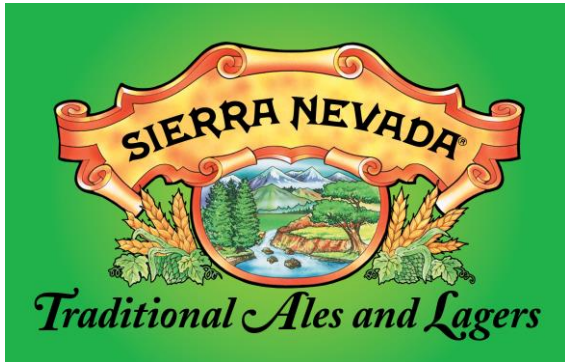
Energy-from-waste  
(anaerobic)

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Energy-from-waste  
(combustion) not count as  
part of 90% diversion

How to Prove? Third-party Certifications

# US Zero Waste Business Council



***NORTHROP GRUMMAN***

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# NSF-ISR

Less Than 1%  
Diversion Rate

- Demonstrate that less than 1 percent of process waste is being sent to land

Reuse

Recycle

Compost

Energy-from-waste  
(anaerobic)

Energy-from-waste  
(combustion)

How to Prove? Third-party Certifications

# NSF-ISR



SUNPOWER®

In Tremonton, Utah  
processing facility

## Green Circle Certified

No Specific Threshold

Performing a material flow and mass flow analysis, GreenCircle quantifies and certifies a percentage of waste diverted from landfills

In other words, there are no specific thresholds, but will certify to the exact percentage,

Reuse

Recycle

Compost

Energy—from—waste  
(anaerobic)

Energy—from—waste  
(combustion)



How to Prove? Third-party Certifications

## Green Circle Certified



*\*Note that no percentage levels are specified for these examples*

## VII. Why?

### **The Whys from the Eco-wise**

Why?

## Brand Strategy

“Our belief in creating truly natural products that are good for you, the environment,

“We have found that **we can do well by doing good.**”

—Environmental Sustainability Manager Steve Walker, **Burt's Bees**

Why?

## Industry Leadership

As part of our commitment to **being an industry leader in every aspect of our business**, Bridgestone Americas strives to be a good steward of the earth and its resources.

Bridgestone has a long-standing commitment to sustainability that is reflected in our company's environmental mission "to help ensure a healthy environment for current and future generations." --**Bridgestone**

Why?

## Competitive Advantage

“It provides us with a **competitive advantage** within the lift truck industry to say that we focus on sustainable **manufacturing** and have an environmental management system. It becomes engrained in everything that you do. It becomes second nature.”

**-Crown Equipment**

# Meet Consumer Demand

There's an increasing **appetite** from consumers to have **products that are more eco-friendly.**

“You remove waste and eliminate that cost—maybe even make it an income stream—and it goes **straight to the bottom line.**”

Our guiding values are integrity, service, quality, people, performance, innovation, growth. **It's the right thing to do.**

—Brenda Demaree, Purdy Professional Paint, Sherwin-Williams



Why?

## Waste Costs

“At one time that people would say, ‘Oh it costs too much to be environmentally friendly. We can’t do that.’ I think now, people are finally realizing that **it really costs too much money to *not* be environmentally friendly--that waste is money.** That whenever you’re throwing something out, you’re spending money. You’re paying for it at the front end. You’re paying for its disposal.

--Denise Coogan, **Subaru**

# Good Materials Management

**Managing waste well** is part of the company's sustainability vision statement that includes sustainable product and workspace design. **“It’s just good business sense.”**

“Our founder, G.W. Haworth, would call me up and say, ‘**Why are we throwing this away?**’ And so our background was to understand what our waste streams were and to try to reduce those.—Bill Gurn, **Haworth**

# Sustainability Program

Schick sought to improve its waste recycling

rate as **an extension of**

**our sustainability**

**program** and ongoing

**continuous**

**improvement** initiatives of the

company's ISO 14001 program, -Scott

Sutkowski, **Schick/Energizer**

# Change Company Culture

“The biggest part of our success, I feel, is how our employees have taken ownership of the program—how they have become empowered—the **whole evolution of environmental responsibility.**

Employees here go home, make those changes there, affect their spouses, their family members who work at all these other places, their children in their schools, the community--Bill Harris, Freightliner Custom Chassis.

“People who used to throw things out of the window of their cars now are looking to reduce the waste we generate.”—  
Ryan Pennington, Freightliner Custom Chassis

# Overall Environmental Effects

“We all look for ways that we can improve the environment.

It’s something that’s a given now. **It changed the culture.** As a result, we’ve seen a huge reduction in all of our environmental metrics.”

—Rhonda Scherer,

**National Office Furniture**

“Eco-responsible”

Eco-responsible