

OHIO EPA 2016 COMPLIANCE CONFERENCE

Going For The Gold

Presented by: Brian Duffy

Steps to Establish an Environmental Stewardship Program

Goals of this talk.

Where are you in the process?

How can we help you achieve E3 status?

Crown Equipment Corporation

- **Largest Manufacturer of Electric Lift Trucks**
- **5th Largest Manufacturer of all Lift Trucks Worldwide**
- **Headquartered in New Bremen, OH**
- **Privately Held Company, 3rd Generation Owners**
- **Manufacturing Facilities:**
 - Ohio (7)
 - Indiana (2)
 - North Carolina (1)
 - International operations
 - Germany, Australia, Mexico, China



Vertically Integrated Manufacturing

- Heavy Fabrication
- Welding
- Motor Manufacturing
- Machining
- Plating
- Electronics
- Wire Harnesses
- Painting
- Assembly



Steps to Establish an Environmental Stewardship Program

How did we do it?

Crown had an advantage

A long history of accomplishments

Crown Sustainable History

Our history as a sustainable company has been proven throughout the years

1993: State of Ohio's Pollution Prevention Award

2003: USEPA National Waste Minimization Partner

2008: Ohio Award for Outstanding Achievement in Environmental Stewardship

2009: Zero Landfill Achievement – NKO

2010: ISO 14001 Achieved - NKO

2010: Ohio Award for Outstanding Achievement in Environmental Stewardship

2011: Zero Landfill Achievement – Plant 7

2012: ISO 14001 Achieved – Plant 7

2014: E3 Gold Status Award -New Knoxville

2015: E3 Gold Status Award -Plant 7

Steps to Establish an Environmental Stewardship Program

Tips for getting started

Establish a Champion to “Carry the Flag”

Review the status you may be able to achieve (Achievement, Silver or Gold)

Review the criteria in the application

Strongly consider ISO14001

Establish a cross-functional environmental improvement team

Steps to Establish an Environmental Stewardship Program

Environmental Stewardship Criteria

Reduction of impact to the environment (toxics and/or waste reduction)

Resource conservation (recycling, reuse and/or use of renewable materials)

Management commitment

Employee involvement

Continuous improvement

Environmental management systems

Promotion and dissemination

Innovation

Impact to the environment (if not addressed as main criteria)

Life cycle analysis

Improvement in environmental performance

Pollution prevention

Energy efficiency, Green building, Renewable energy

Steps to Establish an Environmental Stewardship Program

Environmental Stewardship Criteria

Reduction of impact to the environment (toxics and/or waste reduction)

Resource conservation (recycling, reuse and/or use of renewable materials)

Stormwater best management practices

Environmentally preferable purchasing

Recycling programs

Organics diversion

Economic benefits

Environmental management accounting

Voluntary or non-mandatory initiative

Federal program participation

Source water protection program participation

Steps to Establish an Environmental Stewardship Program

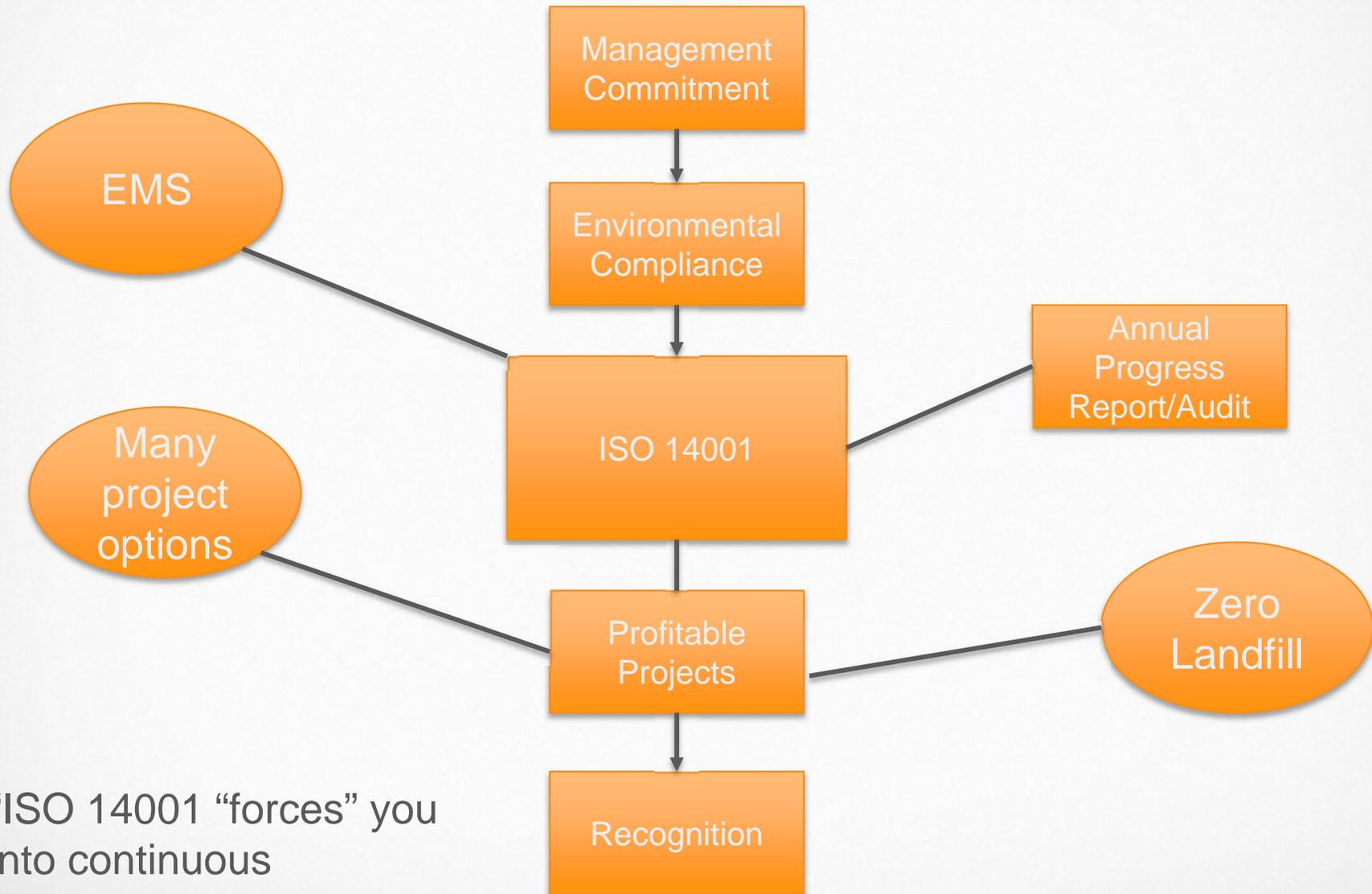
Tips for getting started

Review and determine appetite for an EMS (Investigate ISO14001)

Investigate ISO 14001 (There is a new version of this standard)

- Provides an EMS framework
- Aspects and Impacts
- Legal and compliance
- Requires objectives and targets
- Management support

Steps to Establish an Environmental Stewardship Program



“ISO 14001 “forces” you into continuous improvement”

Steps to Establish an Environmental Stewardship Program

Tips for getting started

Identify activities that are already occurring

- Energy saving projects
- Water conservation
- Re-use of materials
- Recycling
- Substitution of hazardous chemicals
- Brownfield redevelopment

Most projects of this type make good business sense

Steps to Establish an Environmental Stewardship Program

Easy wins

- Returnable packaging
- Lighting
- Free energy audits (University of Dayton)
- Paper (towels) products
- Recycling

Tracking Information & Reports

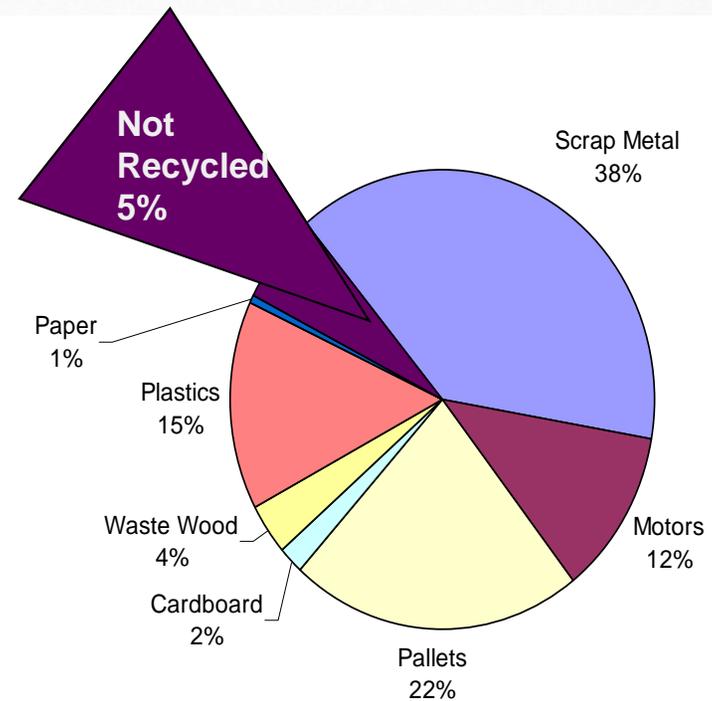
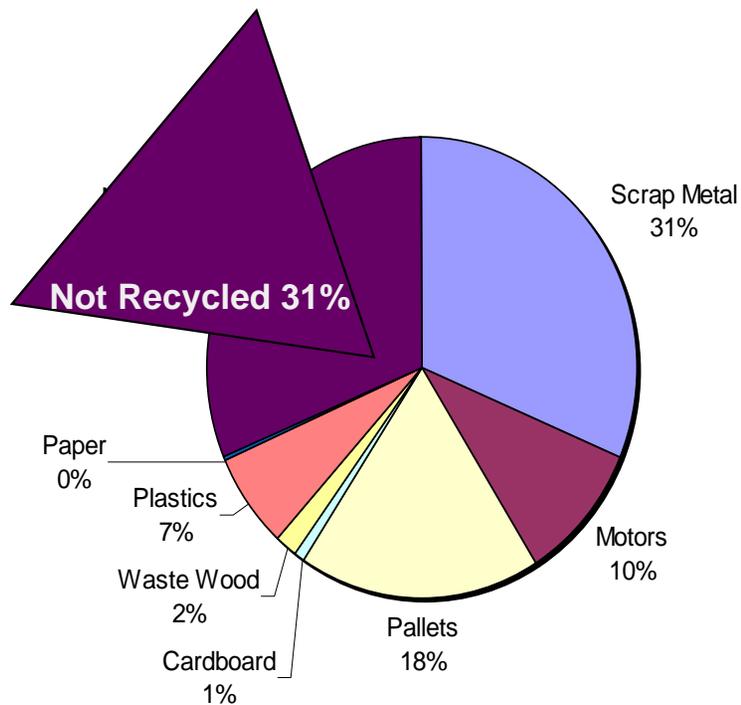
Establish a tracking system

| | 2012 Total Recycled Lbs | 2012 Total Recycled Tons | 2013 Total Recycled Lbs | 2013 Total Recycled Tons | 2014 Total Recycled Lbs | 2014 Total Recycled Tons | 2015 Total Recycled Lbs | 2015 Total Recycled Tons |
|--|-------------------------|--------------------------|-------------------------|--------------------------|-------------------------|--------------------------|-------------------------|--------------------------|
| Aluminum | 34,100 | 17 | 40,129 | 20 | 43,234 | 22 | 45,236 | 22 |
| Copper | 41,010 | 21 | 45,120 | 23 | 33,744 | 17 | 52,712 | 26 |
| Iron | 98,911 | 49 | 129,891 | 65 | 127,747 | 64 | 132,000 | 66 |
| Engineering Grade Plastics | 31,550 | 16 | 23,393 | 12 | 7,354 | 4 | 6,697 | 3 |
| Miscellaneous Plastics | 58,045 | 29 | 56,056 | 28 | 85,561 | 43 | 57,463 | 28 |
| Shrink Wrap | 24,874 | 12 | 30,799 | 15 | 11,009 | 6 | 7,203 | 3 |
| Paper | 96,474 | 48 | 75,221 | 37 | 83,404 | 42 | 77,009 | 38 |
| Wood | 46,400 | 23 | 58,400 | 29 | 41,508 | 21 | 48,410 | 24 |
| Cardboard | 177,076 | 89 | 178,798 | 90 | 201,289 | 101 | 151,561 | 75 |
| Totals | 608,440 | 304 | 637,807 | 319 | 634,850 | 320 | 578,291 | 285 |
| Recycling of Metals Cost Savings | \$150,787.99 | | \$167,992.06 | | \$131,921.04 | | \$129,788.73 | |
| Recycling of Engineering Grade Plastics Cost Savings | \$640.00 | | \$480.00 | | \$160.00 | | \$0.00 | |
| Recycling of Miscellaneous Plastics Cost Savings | \$870.00 | | \$840.00 | | \$1,290.00 | | \$0.00 | |
| Recycling of Shrink Wrap Cost Savings | \$660.00 | | \$825.00 | | \$330.00 | | \$0.00 | |
| Recycling of Paper Cost Savings | \$1,440.00 | | \$1,110.00 | | \$1,260.00 | | \$0.00 | |
| Recycling of Cardboard Cost Savings | \$4,895.00 | | \$4,950.00 | | \$5,555.00 | | \$0.00 | |
| Totals | \$159,292.99 | | \$176,197.06 | | \$140,516.04 | | \$129,788.73 | |
| Air Emissions | | | | | | | | |
| <p>In 2012, Crown NKO used 3765 gallons of water-based resin and paint to coat motors for Crown lift trucks. Operation of the line was 10 hours per day, 5 days per week. Total tons of VOC/year was 2.60 tons of VOC. Our permit VOC tons per year requirement is 15.4 tons/year.</p> | | | | | | | | |
| <p>In 2013, Crown NKO used 6144.5 gallons of water-based resin and paint to coat motors for Crown lift trucks. Operation of the line was 16 hours per day, 5 days per week. Total tons of VOC/year was 4.25 tons of VOC. Our permit VOC tons per year requirement is 15.4 tons/year.</p> | | | | | | | | |
| <p>In 2014, Crown used 7228 gallons of water-based resin and paint to coat motors for Crown lift trucks. Operation of the line was 16 hours per day, 5 days per week. Total tons of VOC/year was 5.11 tons of VOC. Our permit VOC tons per year requirement is 15.4 tons/year.</p> | | | | | | | | |
| <p>In 2015, Crown used 7670 gallons of water-based resin and paint to coat motors for Crown lift trucks. Operation of the line was 16 hours per day, 5 days per week. Total tons of VOC/year was 13.20 tons of VOC. Our permit VOC tons per year requirement is 15.4 tons/year.</p> | | | | | | | | |

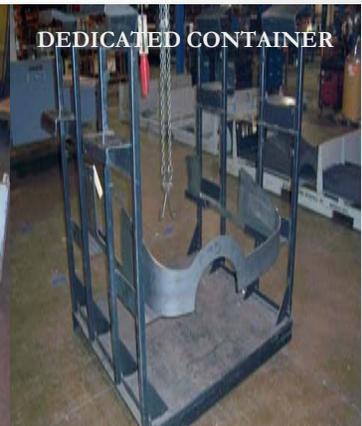
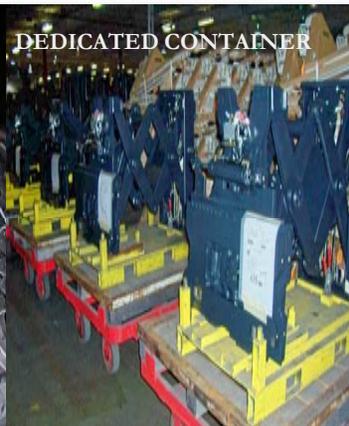
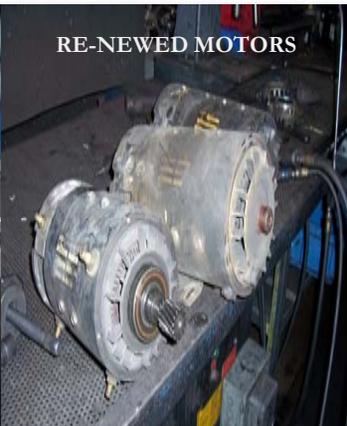
Return on Investment

- Zero Landfill Implementation

Recycled Waste Analysis



New Knoxville Zero Landfill



Return on Investment

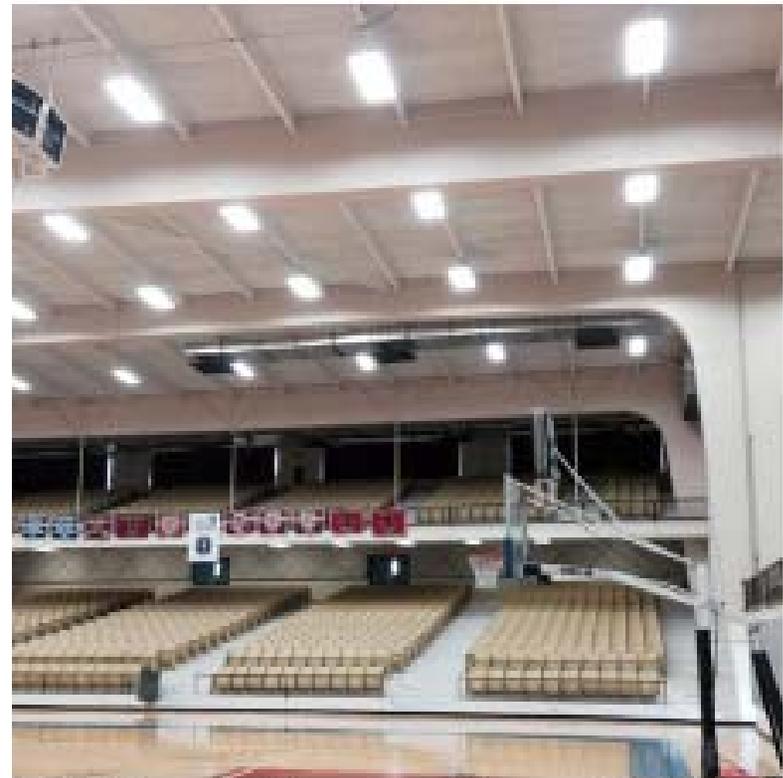
- Lighting Upgrades

Before



HID lighting (Metal Halide & Mercury Vapor)

After



T5 fixtures (48 8-Lamp, 22 4-Lamp, 32 3-Lamp)

Return on Investment

- Injection Molding Machine Replacement
- Hydraulic to Electric



Was this a “sustainability” project

CROWN

IDEAS THAT ADVANCE



56 Years of Excellence
1960 – 2016



Who Are We?

Manufacturer

Privately held

150 employees

In 3 NE Ohio facilities



What Do We Make?

Natural Rubber Latex Tubing



Dipped Molded Parts



Extruded non-latex Tubing



Free-Band® Tourniquets



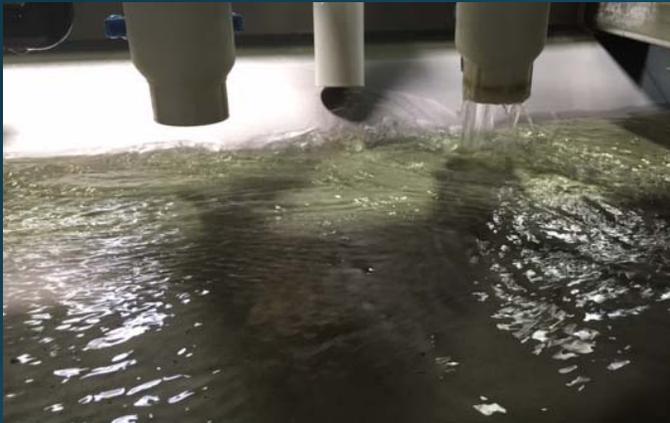
What Do We Make?



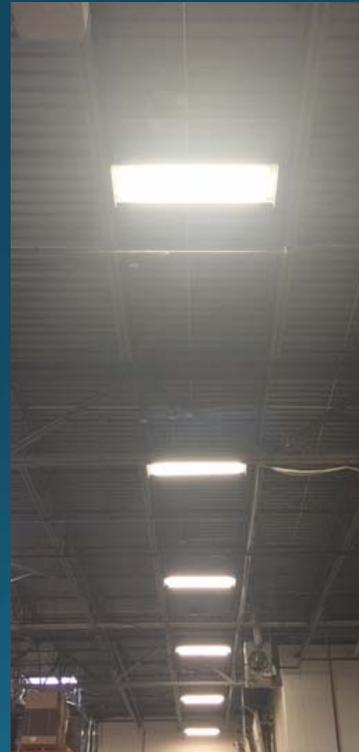
What Did We Accomplish?

REDUCTIONS

Water – 59%



Electric – 18%



Dumpsters – 79%



What Did We Accomplish?



SILVER LEVEL

GOLD LEVEL

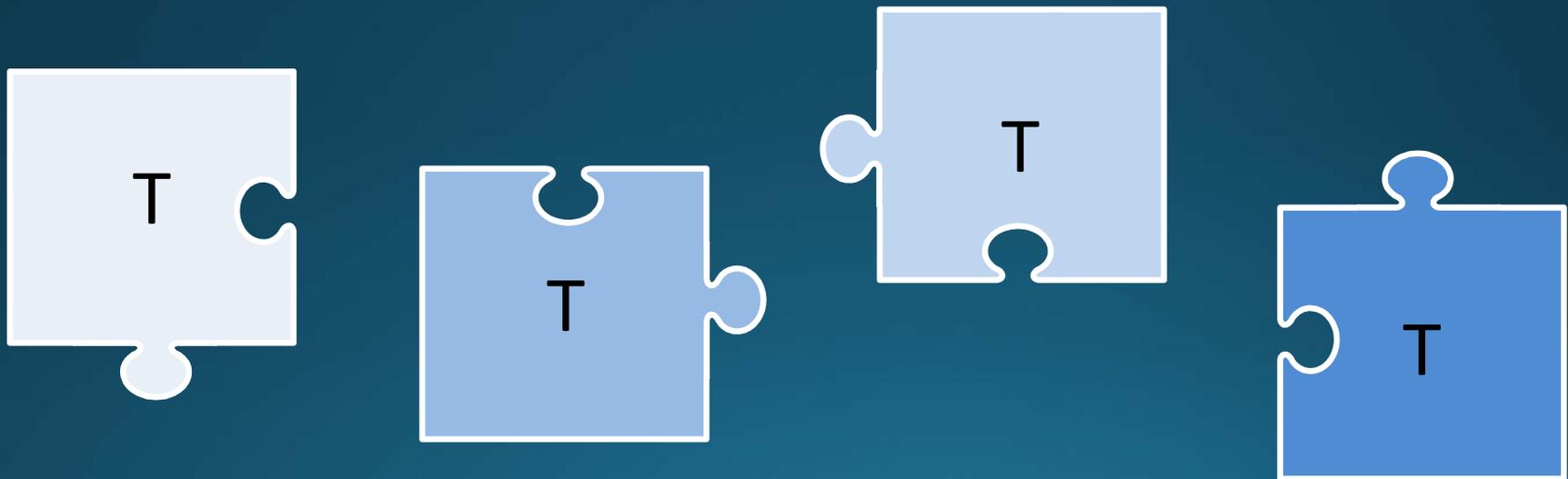


HOW Did We Do It?



HOW Did We Do It?

Continuous Improvement Lean Enterprise



HOW Did We Do It?



What is a Kaizen?

- 5 people +
 - “expert” in the process
 - “novice” to ask “why not”
- 1 week
- \$1,000 budget
- Pre-Kaizen training EVERY TIME
- Perks: Lunch + T-shirt



One early improvement event showed.....

**WE CAN DO
ANYTHING!**





BEFORE



AFTER

ENERGY Kaizen(s)



Goals:

- 1) Map and define the energy uses for all departments.
- 2) Evaluate the best way to reduce energy needs or eliminate usage.
- 3) Complete all energy savings tasks they can during the kaizen.
- 4) Provide a plan & cost benefit for future energy reduction products.
- 5) Create a way to sustain the energy reductions.
- 6) Create an awareness program for all KEP employees.

ENERGY Kaizen(s)

Easier:

- Insulate
- Seal leaks & gaps
- Shut down procedures
- Turn off
- Post reminders
- Energy Audits & Checklists



Green idea

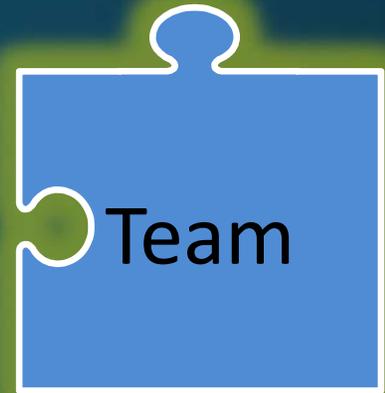
TURN OFF
your printer
at night



ENERGY improvements

More difficult:

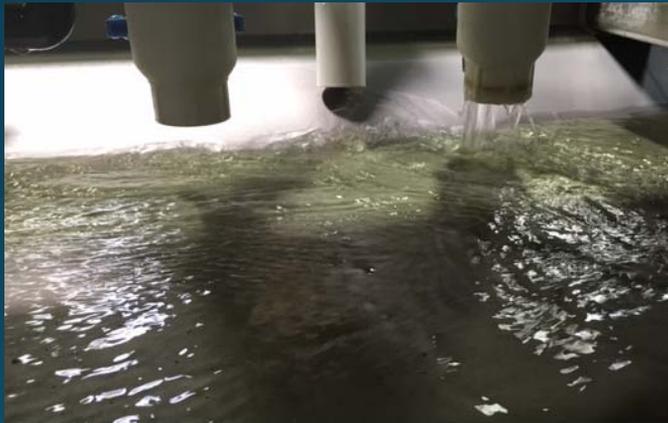
- Install motion sensors
- Smaller hot water tanks
- Re-circulate water in chillers
- Re-lamp with energy efficient
- Replace doors
- Optimize with Variable Speed air compressors
- Optimize settings (air, boiler, chiller)



ENERGY

**Electric – 18%
reduction**

Water – 59% reduction



DUMPSTER Mini-Kaizen(s)

Goals:

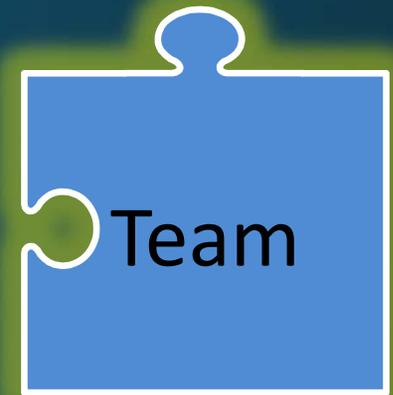
- 1) Zero landfill
- 2) Reduce, Re-use, Recycle



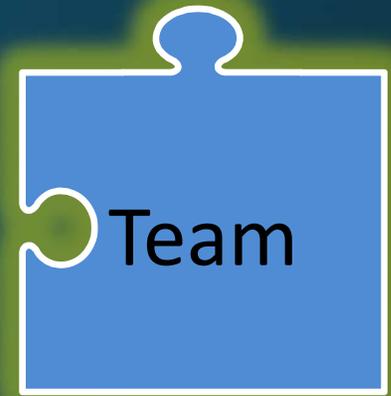
DUMPSTER Mini-Kaizen(s)

Easier:

- Recycling cardboard, plastic, paper
- Lunchroom recycling
- Eliminate Styrofoam cups



DUMPSTER improvement



More difficult:

- Eliminate paper towels
- Selling scrap latex



DUMPSTER

79% fewer Dumpsters



IDEAS: Get creative

- Sustain it



IDEAS: Get creative

- Dumpster contest



IDEAS: Get creative

- Postings

KENT ELASTOMER PRODUCTS WINESBURG PLANT

CURRENTLY RECYCLED

| ITEM | DESCRIPTION |
|----------------------|---|
| Air Compressor Water | Water collected from air compressor condensation |
| Auto-Bag Spools* | Corrugated bag spools with plastic end caps |
| Ballasts | Fluorescent light fixture ballasts |
| Batteries | Wet and dry cell |
| Cans & Bottles | Aluminum, glass, plastic and steel containers |
| Cardboard | Corrugated boxes, cartons, liners, containers |
| Chipboard | Non-corrugated boxes, paper towel / toilet paper rolls, poly bag cores, label and ribbon cores |
| Electronics | Computers, monitors, misc electronic equipment |
| Food* | Leftover or uneaten food (garbage disposals) |
| Fluorescent Bulbs | Straight tube style |
| Isopropyl Alcohol | Used alcohol from assembly |
| Latex | Tubing, custom dip parts, gloves |
| Metals | Carbon steel, stainless steel, cast iron, brass, bronze, copper, aluminum, cutter blades, box cutter blades |
| Neoprene | Custom dip parts (SM, O-ring bellows, etc.), gloves |
| Nylon | Fluoro-mandrel, coloplast tubing |
| Pallets | Old pallets or skids from incoming elements, broken pallets |
| Paper | Copy / printer paper, labels, tags |
| Plastic Film (PET) | Low density bags (clear), high density bags (rinky), stretch film |
| Poly Banding* | Black or White polypropylene |
| Polyethylene (PET) | #1 Rigid plastic, spool end caps, cracked or broken tubes & bins |
| Polystyrene | Custom dip poly parts |
| Polystyrene (Rigid)* | Spool end caps |
| Printer Cartridges | Inkjet, laser and copier cartridges |
| Silicone | Tubing mandrel |
| Tungsten Latex | Tungsten gloves |
| Tube end caps, 3" | Re-used for Mite safety packaging |
| Wood* | Pieces of broken pallets, maintenance scrap |

*Added to recycled list 03/24/15





Don't FORGET!

NOT RECYCLED-YET

| ITEM | DESCRIPTION |
|-------------------------------|---|
| Randages & Blood Contaminated | Band-aids, gsm, finger tops, paper masks, tubing |
| Cleaning Supplies | Sprays, wipes, cleaning rags |
| Food Contaminated Containers | Plastic or paper with significant food contamination that cannot be rinsed clean |
| Gloves | White or black cut resistant gloves used on the line |
| Incandescent Bulbs | Regular light bulbs, green end fluorescent bulbs |
| Mixed Materials | Chopped tubing, floor scrap mixed with dirt, steel & mandrel, Coloplast paper/plastic |
| Polystyrene (Styrofoam) | Cups, plates, food containers, packing peanuts, packing materials |



IDEAS: Get creative

- Auction for Charity!



IDEAS: Steal!!

- Conferences
- Customers
- Suppliers
- Tours

SUMMARY: Success tips



Be Creative

Steal Ideas



THANK YOU!



Saving lives and making life better
through well-being solutions

*Bring well-being to
one billion people every day*



A Purpose-Driven, Family-Owned Business

The GOJO Purpose - Saving Lives and Making Life Better Through Well-Being Solutions



Sustainability has been inherent to everything we do since our founding in 1946

- Safe alternative for cleaning hands
- First portion controlled dispenser
- First waterless hand cleaner



Sustainable Ways of Working (SWOWSM)

Sustainable Ways of Working (SWOWSM) is our unique approach of integrating sustainability into everything we do. There are five core principles of SWOW:

1. Leading & Learning
2. Proactive Continuous Improvement
3. Economic Responsibility
4. Environmental Management & Compliance
5. Stakeholder Collaboration



Measuring and Transparently Communicating Our Progress

Our Social Sustainability Goal for 2020:

“Bring Well-Being to
1 BILLION
People Every Day”



Results through 2015:

53% increase in
Hand Hygiene Delivered



2015 GOAL: Reduce water usage by **30%**

Results through 2015:

51% Reduction



2015 GOAL: Reduce solid waste by **25%**

Results through 2015:

47% Reduction



2015 GOAL: Reduce GHG emissions by **5%**

Results through 2015:

46% Reduction

2015 Corporate Sustainability Scorecard

Progress Since 2010



+ 53% ▲

Hand Hygiene Delivered
(skin care product shipped in equivalent uses)



+217% ▲

Certified Products
(sales from sustainably certified products)



+6 % ▲

Waste Recycled
(ratio of waste recycled vs. produced)



-51% ▼

Water Use
(gallons /1,000 uses produced)

(2010 Goal Exceeded)



-47% ▼

Solid Waste All Generated
(pounds /1,000 uses)

(2010 Goal Exceeded)



-46% ▼

GHG Emissions Scope 1&2
(equivalent kg of CO₂ /1,000 uses)

(2010 Goal Exceeded)



-70% ▼

Hazardous Waste
(weight of hazardous waste treated or transported)



-29% ▼

Accidents
(OSHA reportable)



-56% ▼

Accidents
(OSHA lost time)

The GOJO E3 Journey

Achievement Level (2012)

- Implemented Environmental Management System (EMS)
- Chartered sub-teams to focus on achieving 2015 goals

Silver Level (2015)

- Continued focus on 2015 goals. Between 2010 and 2013, we achieved the following:
 - 40 % reduction in water usage
 - 36% reduction in solid waste generated
 - 46 % reduction greenhouse gas emissions
- In 2013, we changed our hazardous waste generator status from large to small quantity generator and eliminated more than 9,000 pounds of hazardous waste

Committed to Gold Level (2015)

- Provided updates on two key initiatives:
 - Manufacturing Scrap Improvement
 - SafeWater



EPA E3 Gold Level Award



Ohio EPA Director Craig Butler presenting E3 Gold Award to GOJO Chief Supply Chain Officer and VP Ron Hammond



Cuyahoga Falls Mayor Don Walters congratulating GOJO on achieving E3 Gold Award

EPA E3 Gold Level Award



Manufacturing Scrap Improvement Team (2013-2015)

Team Objective: Cross-functional team focused on minimizing waste, streamlining processes and improving the cost to manufacture finished goods

2015 Goals

- Identify new opportunities to continue to reduce waste and maintain 2014 improvements
- Establish a baseline and reduce waste generated on the Bag-in-Box (BIB) lines from leaking film



Manufacturing Scrap Improvement Team

2015 Team Accomplishments:

- Discovered that component defects and worn equipment were major contributors to waste
- Updated procedures to include inspections to identify component defects and other waste reduction opportunities
- Developed training guides and visual aids focused on defects and equipment upgrades and trained over 300 production and maintenance team members
- Created and posted visuals at production lines indicating cost of waste per each filled bottle/bag
- Reduced line scrap rate from 0.53% (2013) to 0.30% (2015)
- Reduced leaker scrap by 47% in 2015
- Identified future projects

Ongoing progress:

- Team won the GOJO SWOW team award for work completed in 2015
- Production Supervisors and Leaders now responsible for maintaining and ensuring waste reductions



Background: SafeWater™ is a water process skid that uses electricity, salt and water to produce Sodium Hydroxide (Cleaning Solution) and Hypochlorous Acid (Sanitization Solution) at concentration

Safety

- Used at ambient temperature
- Less harmful than other cleaning and sanitization solutions

Environmental

- Neutralized by contact with small amounts of organic material
- Low/no COD contribution

Quality

- 100 x more effective than bleach
- Less corrosive than bleach

Sustainability

- No rinse between cleaning and sanitization
- Testing RO reject as feed source (~6MM gallons)
- Installing new clean in place systems
- Installing high efficiency spray nozzles across all mix vessels



Project Status (scheduled for completion end of 2016):

- Completed design and purchased long-lead time equipment end of 2015
- Installed the Industrial Reverse Osmosis skid
- Completed build and testing of two new SafeWater generation systems
- Installation of storage & distribution system in progress
- Points of use connections will start after storage and distribution system is completed
- FDA validation in progress
- Completed initial RO reject analysis and second round of sampling

Continued Commitment GOJO 2020 Sustainable Value Strategies and Goals

| Five-Year Strategy | 2020 Goals |
|--|--|
| Innovate to Create Sustainable Value | <ul style="list-style-type: none"> • Double global sales from products with third-party certifications • Establish and maintain an industry-leading sustainable chemistry policy, including reducing our Chemical Footprint by 50% • Source reduce packaging material by 15% |
| Elevate Public Health and Well-Being | <ul style="list-style-type: none"> • BHAG: Bring Well-Being to One Billion People Every Day • Be the most recognized advocate for well-being through hygiene in our industry |
| Steward a Thriving Environment | <ul style="list-style-type: none"> • Recover and reuse or recycle 50% of dispenser materials from the value chain • 90% of GOJO Strategic, Preferred and Collaborative suppliers meet GOJO Sustainable Value Responsible Sourcing Criteria • GOJO distribution operations powered by renewable energy |
| Foster a Culture of Sustainable Value | <ul style="list-style-type: none"> • Core processes are infused with SWOWSM to create Sustainable Value • All employees are engaged in SWOWSM |



THANK YOU