



Implementing a Sustainability Program in your Operation: Tying LEAN into Sustainability in a Practical Application

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Crown Vertical Integration Model





Sustainability History

- Our history as a sustainable company has been proven throughout the years:
 - 1993: State of Ohio's Pollution Prevention Award
 - 1994: Eliminated solvent degreasing
 - 2003: USEPA National Waste Minimization Partner
 - 2008: Ohio Award for Outstanding Achievement in Environmental Stewardship
 - 2009: Zero Landfill Achievement
 - 2010: ISO 14001 Achieved and Ohio Award for Outstanding Achievement in Environmental Stewardship
 - 2011: Zero Landfill Achievement
 - 2012: ISO 14001 Achieved
 - 2014: Ohio EPA E3 Gold Status Award (NKO), Most Valuable Pollution Prevention Award (MVP2), Hosted Zero Waste to Landfill Workshop
 - 2015: Ohio EPA E3 Gold Status Award (Plant 7)



Agenda

- The “What's” and “Whys” of Sustainability?
- LEAN and Sustainability
 - How to improve sustainability using LEAN principles
- Getting Started
 - Documentation
- Wrap-Up



Where are you in Your Sustainable Journey?

- Audience discussion

(This is the audience participation part)

- What specifically are you interested in learning about ?



What is Sustainability?

- Definition: *sustainability* is the ability to continue a *defined* behavior indefinitely
- Sustainable
adjective sus·tain·able \sə-'stā-nə-bəl\
 - Simple Definition of *sustainable*
 - : able to be used without being completely used up or destroyed
 - : involving methods that do not completely use up or destroy natural resources
 - : able to last or continue for a long time



What is Sustainability?

Figure 1 — The seven core subjects at a glance





What is Sustainability?

Which criteria are taken into account in the evaluation?

The methodology relies upon CSR international standards (e.g. Global Compact, ISO 26000). It includes **21** criteria, divided into 4 themes. Only criteria that are **relevant** for your **sector** specific challenges are taken into account.



Energy consumption & GHG (CO2)
Water
Biodiversity
Local Pollutions
Materials, Chemicals, Waste

Product Use
Product End-of-Life
Customers Health & Safety
Sustainable Consumption



Employee Health & Safety
Working Conditions
Social Dialog
Career Management & Training

Child & Forced Labor
Discrimination
Fundamental Human Rights



Corruption & Bribery
Anti-Competitive practices
Responsible Marketing



Suppliers Environmental performance
Suppliers Social practices



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What is Sustainability?

- One way of looking at sustainability – The triple bottom line
- More of a business focused definition





What is Sustainability?

- Another way to look at sustainability is by incorporating lean methodologies into your day-to-day work practices. Lean production and sustainability share the same goals and objectives
 - Elimination of waste
 - Maximize use of resources
 - Achieve long term efficiency in processes
- Lean & Sustainability can be used as a part of the same business strategy of improving operations costs





Why Sustainability?

- Why implement sustainability?
- B to B companies
- B to C companies



Why Sustainability? - Value

- Improved sales
 - Innovation
 - New Technology
- Cost Reduction
 - Waste Reduction
 - Product Efficiency
 - Safety
 - Operational Excellence
- Brand Value
 - Promoting the company image
 - Social Responsibility
 - Ethics
- Risk Management
 - Regulatory
 - Strategic
 - Environmental
 - Safety



LEAN and Sustainability

The meeting of the waters.





LEAN and Sustainability

How to improve sustainability using LEAN principles

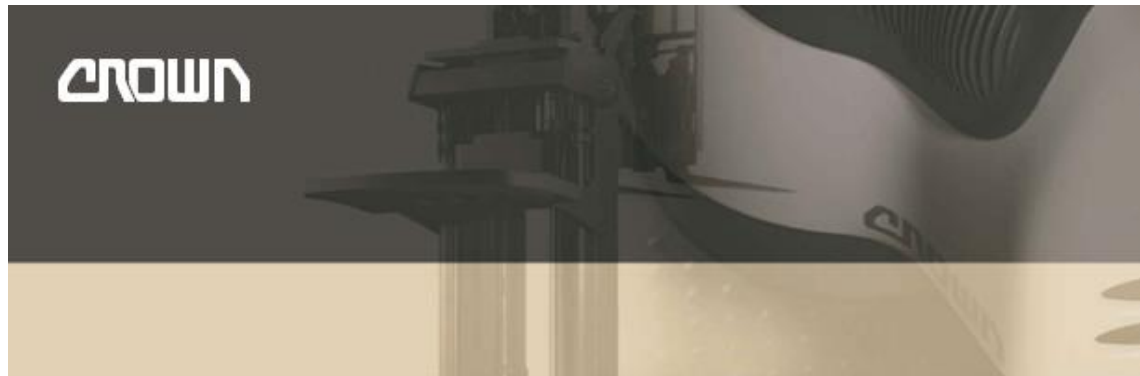
- Employee Engagement
- Waste Identification and Reduction
- Gemba Walks
- Continuous Improvement



LEAN and Sustainability

How to improve sustainability using LEAN principles

- Employee Engagement
 - Employee Initiative Program



Crown's Sustainability Commitment Employee Presentation

February, 2008



LEAN and Sustainability

How to improve sustainability using LEAN principles

- Employee Engagement
 - Safety Teams
 - Safe Steps – Behavior Based Safety
 - Environmental Sustainability Teams
 - Crown Challenge



LEAN and Sustainability

How to improve sustainability using LEAN principles

- Employee Engagement
 - Use team meetings to generate ideas
 - Turn the associates “loose”
 - Observation checklists (5S, standard work, kaizens and CI’s) Note: Sustainability should be a discussion point in all LEAN events including Kaizen, VSM, etc.
 - Recognition



LEAN and Sustainability



Director Butler Honors Crown Equipment with First E3 Gold Recognition



LEAN and Sustainability

How to improve sustainability using LEAN principles

- Waste Identification

Lean Wastes

- Defects
- Overproduction
- Waiting
- Non-utilized Resources
- Transportation
- Inventory
- Motion
- Excess Processing

Green Wastes

- Water Usage
- Chemical
- Hazardous Wastes
- Air Contaminants
- Noise
- Gas Consumption
- Electric Consumption
- Solid Wastes



LEAN and Sustainability

How to improve sustainability using LEAN principles

- Zero Waste to Landfill
 - Benefits
 - Rethink, Recycle, Reuse, and Reduce
 - Challenges





LEAN and Sustainability

How to improve sustainability using LEAN principles

Pre/Post Cost Analysis- Zero Landfill/LEAN

Pre - 1/26/09		Zero Landfill - 12/1/09	
		* Current Production schedule	
Description	Cost/yr	Description	Cost/yr
52 tons/year @ \$44.74/ton - landfill cost	\$2,326.48	8.58 tons/year @ \$75/ton or \$300/trip if 4 tons or less - 14 trips - Covanta Waste to Energy.	\$4,200.00
Trash truck - 5 trips/week, 18 miles roundtrip, 8mpg, \$2.50/gal.	\$1,462.50	Trash truck - 2 trips/week, 18 miles roundtrip, 8mpg, \$2.50/gal.	\$585.00
2 EE's, 2 hrs/d, 5 d/wk, @ \$25/hour (soft)	\$26,000.00	1 EE's, 2 hrs/d, 2 d/w, @ \$25/hour (soft)	\$5,200.00
Shop Services, 1 EE, 0.5 hrs/w, @ \$25/hr (soft)	\$650.00	Shop Services, 1 EE, 3 hrs/w, @ \$25/hr (soft)	\$3,900.00
Utility Wipes, 2 cases/month, @ \$50/case	\$1,200.00	Utility Wipes, 1 cases/month, @ \$50/case	\$600.00
Garbage bags, 3 cases/month, @ \$23/case	\$828.00	Garbage bags, 2 cases/month, @ \$23/case	\$552.00
Paper Towels, 1.5 cases/month, @\$64.40/case	\$1,159.20	Paper Towels, 0.5 cases/month, @\$64.40/case	\$386.40
		Gaylord Boxes w/ lids and liner. 56/year @ \$27.75/set	\$1,554.00
		Transportation to Covanta - \$85/trip @ 14/year	\$1,190.00
Total cost/year	\$33,626.18	Total cost/year	\$18,167.40
		Total Annual Savings	\$15,458.78
		One time cost - hand dryers/recycle containers, labels.	\$3,600.00



LEAN and Sustainability

How to improve sustainability using LEAN principles

- Gemba Walks



What can we learn from Gemba walks?

Who should be involved in the Gemba walks?



How to improve sustainability using LEAN principles





LEAN and Sustainability

How to improve sustainability using LEAN principles

- CI/Process Improvements
 - Hydraulic oil recycling
 - Powder paint recycling
 - Zero discharge Chrome Plating operation
 - Eliminates hazardous waste
 - Reformulation of Chrome-based paint
 - Elimination of > 300,000 pounds of hazardous waste
 - Lead solder alternatives
 - Installation of powder coating line
 - Elimination of > 65% of the waste water and sludge



Getting Started

Document What You are Already Doing

- Sustainable business practices
 - Includes:
 - HR/Social Issues
 - Corporate social responsibility
 - Working conditions
 - Child labor
 - Health and safety
 - Discrimination
 - Human rights
 - Purchasing
 - Product Design
- These are often policy statements



Getting Started

Document What You are Already Doing

- Management Systems
- Facility Upgrades
- Product Design Development
- Community Involvement
- International Improvements



Getting Started

Document What You Are Already Doing

- Environmental Management System
 - Senior Management Commitment
 - Environmental Policy Development
 - Management Review
- Regulatory and third party registrar support
 - Ohio EPA – Office of Compliance Assistance and Pollution Prevention
- Challenges



Getting Started

Document What You are Already Doing

- Examples of Plant Objectives and Targets from Implemented Environmental Management System
 - Zero landfill
 - Reduction in electrical usage by 15%
 - Eliminated hearing protection in one department
 - Increased the usage of recyclable paper
 - Use only environmentally friendly cleaning products
 - Developed customer visible recycling (all plants)



Getting Started

Document What You are Already Doing

- Customer visible recycling





Getting Started

Document What You are Already Doing

Management System- Support Processes

Operational Excellence	Safety / Environmental Sustainability
<ul style="list-style-type: none">* Lean Management System* Whitebelt 8 Hour Lean Basics Workshop* Modules to ensure standard approach* SME Development at all sites* Annual Assessments 	<ul style="list-style-type: none">* Safe Steps (Behavioral Safety Program)* Safety Teams (Increase Employee Engagement / Ownership)* Ecologic Initiatives - Recycling / 0 Landfill / Awards & Recognition* ISO 14001  
Quality / Six Sigma	Employee Development
<ul style="list-style-type: none">* Breakthrough objectives to protect the brand image* Growing the organizational knowledge in 6 Sigma methods and philosophy<ul style="list-style-type: none">- Internal Yellow Belt, Green Belt, Black Belt courses* Basic Problem Solving Course (5 Why's)* Tick Chart Data Tracking for Employee Engaged & Fast Problem Solving 	<ul style="list-style-type: none">* Individual Development Program (IDP)* Talent Development Discussions (TDD)* Cross Training Matrix* Education Center Building<ul style="list-style-type: none">- 150 Courses Developed- 18,000 courses attended- Employees spend time in training on leadership, communication, and product training* "Leader by Design" New Hire Course started in 2015 



Getting Started

Document What You are Already Doing



New Bremen, Ohio -- Rump's gas station and the Home Furniture Company.



The Crown Education Center



Prior to renovation, Plant 12 was a dairy processing plant.



Today, it is a Customer Presentation Center.



Getting Started

Document What You are Already Doing

Crown has added two million square feet to our manufacturing area over the last 10 years without building a new facility.

Brownfields	Environmental Impact
New Castle, IN	945,000 square feet
Stamco Plant 10	120,000 square feet
Stamco Plant 11	45,000 square feet
Solae Building	32,000 square feet
Tranco Building	9,000 square feet
Greencastle, IN Gas Station	5,830 square feet
TOTAL	1,157,000 square feet



Getting Started

Document What You are Already Doing

- Facility Upgrades

Before



After





Getting Started

Document What You are Already Doing

- Expand Remanufacturing Program
 - Add first purchased control module to renew program
 - Planning for addition of 16 Crown designed modules to renew program





Getting Started

Document What You are Already Doing

- Development of fuel cell technology
- Beginning Life Cycle analysis of manufacturing materials
- Environmentally sustainable product design





Document What You are Already Doing

Improving the Environment

-

The Dicke-Kuenning Natural Area runs right alongside the Miami-Erie Canal.



Getting Started

Document What You are Already Doing



Sent to a non-profit group at no charge & processed by mentally and physically-challenged workforce.



Getting Started

Document What You are Already Doing

- International Improvements
 - Stuttgart's green roofs





Getting Started

Document What You are Already Doing

International Improvements

- Wildlife Volunteers



- Support of the local orphanage





Getting Started

Document What You are Already Doing

- International Improvements
 - Crown Australia works with various charities throughout the year to help those less fortunate than ourselves. The latest donation is to the children's charity, *Variety*.

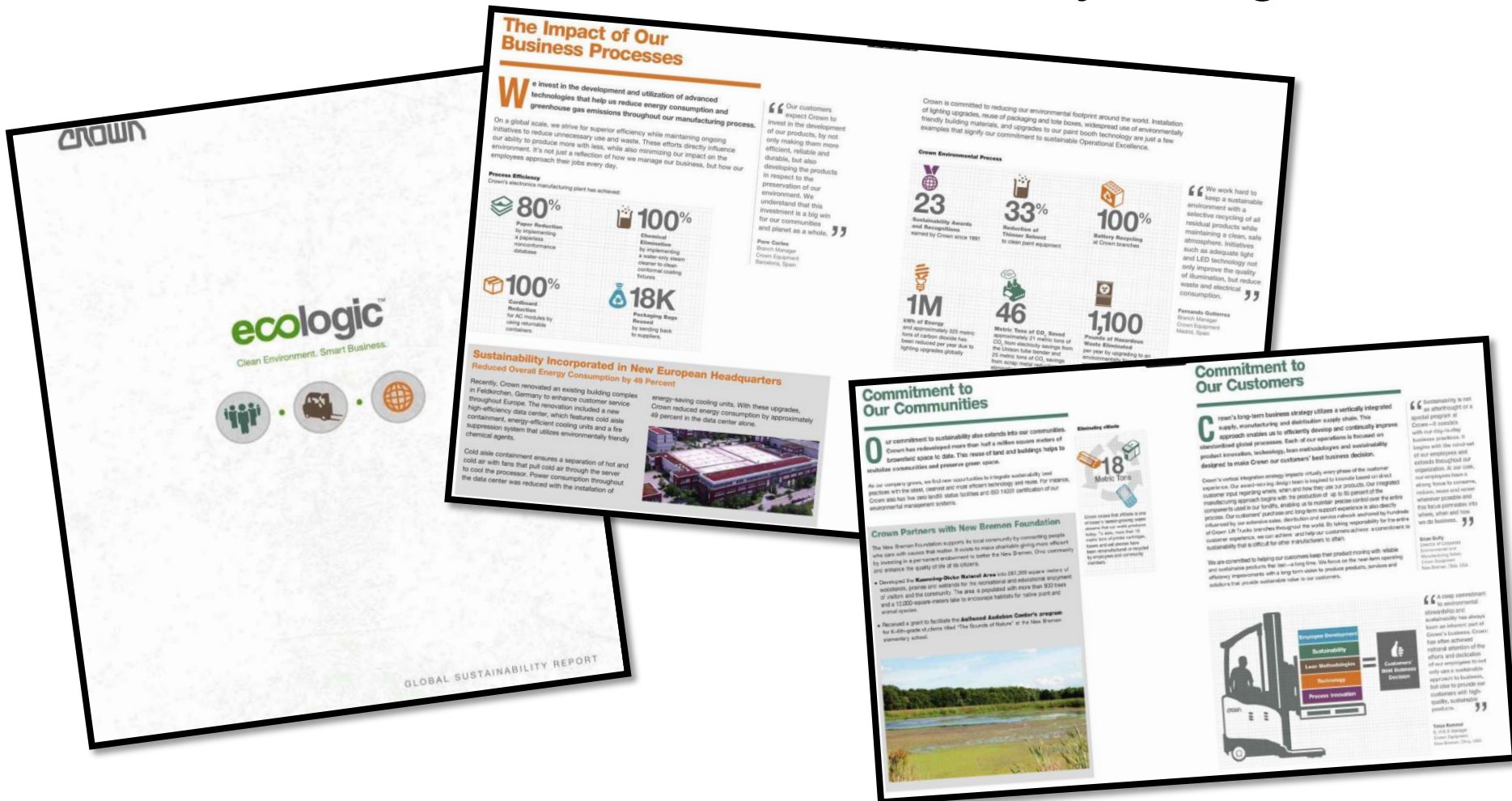
“The Liberty Swing is a revolutionary design in play equipment for people with disabilities, allowing children in wheelchairs to experience the pure fun and exhilaration of a swing.”





Getting Started

Document What You are Already Doing





Wrap-Up Discussion

- Final Thoughts
 - Benefits from LEAN practices to a sustainability program
 - Similarities between sustainable and LEAN practices?
 - If your LEAN program has been successful, does it include sustainability?
 - If not, why not?



Thank You!

Your opinion is important to us!

Please take a moment to complete the survey using the conference mobile app.

Session: WP/23

Implementing a Sustainability Program in your Operation

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