Environmental Opportunities

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CONNSTEP Background

Mission and Target Market

- CONNSTEP's mission is to help Connecticut manufacturers apply advanced manufacturing and management techniques to become more competitive, supporting the growth of the Connecticut economy.

- The target market is mid-size manufacturing operations in Connecticut

Services

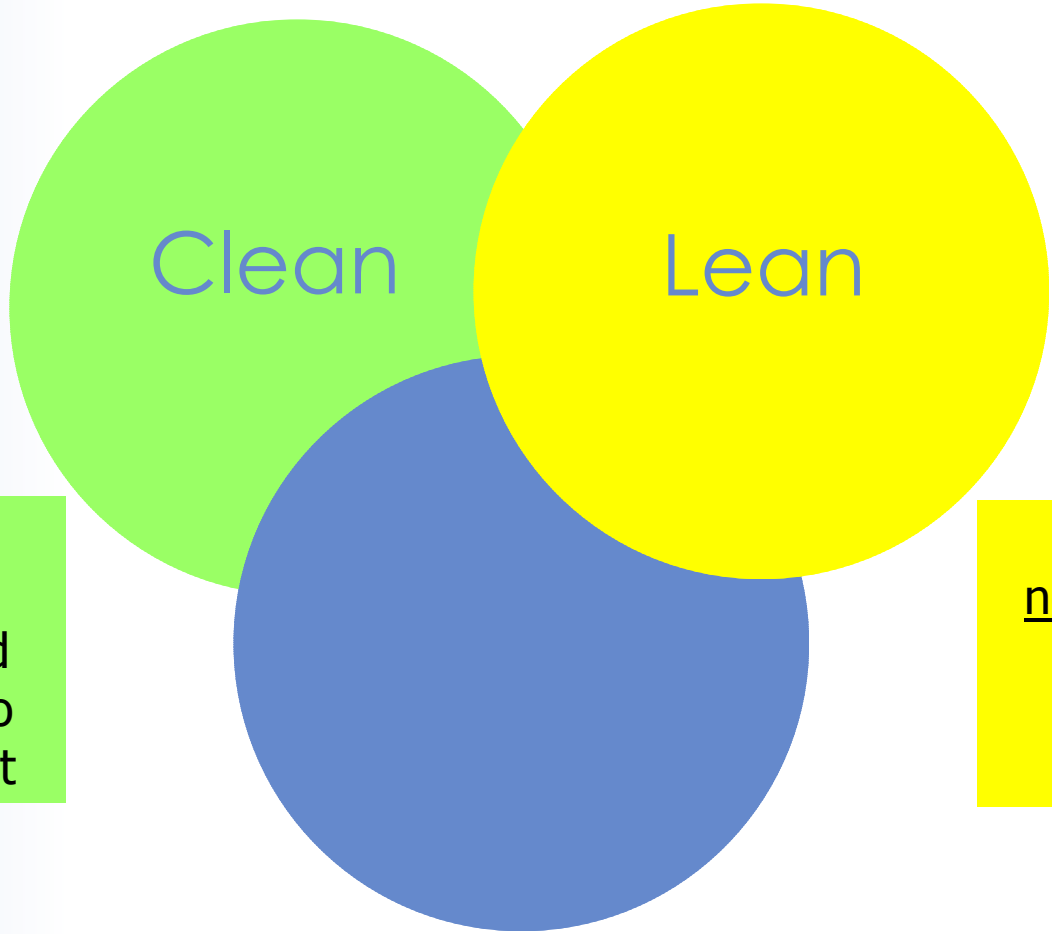
- CONNSTEP's core competency is manufacturing business process improvement
  - Lean Enterprise Services and Six Sigma
  - Quality Managements Systems (ISO, etc.)
  - Environmental and "Clean" Manufacturing
- Management and technology services
  - Culture, Change Management, People Systems
  - Marketing
  - Strategic Planning
  - Access to technical knowledge
  - Support for startups

What Is Waste?

Waste is "anything other than the minimum amount of equipment, materials, parts, space, and worker's time which are absolutely necessary to add value to the product."

- Shoichiro Toyoda, President, Toyota

Seeking to Eliminate Waste



Maximizes resources to reduce *cost* and lessen impact to the environment

Eliminates non-value added activities to maximize efficiency

Standardizes work to meet customer expectations

Defining Clean Manufacturing

Clean is:

A systematic approach to eliminating waste by optimizing use and selection of resources and technologies while lessening the impact on the environment.

Clean Manufacturing Services

- Material Resource Selection and Optimization
- Process Improvements
- Energy Management
- Water Conservation
- Assessments and Audits
- Regulatory Compliance
- ISO 14001, Environmental Management System (EMS)

Combining Lean/Clean Manufacturing

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on-utilized resources

ransportation

nventory

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xtra processing

ull use of Raw Material

nergy Efficiency

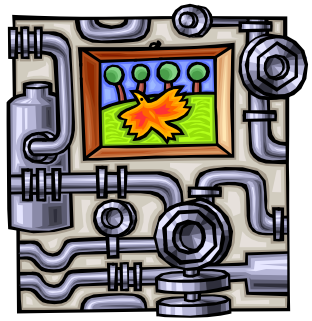
ater conservation

liminating Toxic Material

eduction of:

- Packaging Wastes
- Emissions to Air and Water
- Solid & Hazardous Wastes
- Regulatory obligations and risks

The Need for Lean & Clean

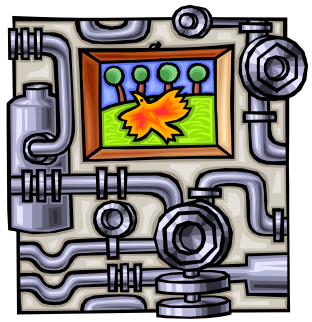


- Dual pressures on American supply chains today
  - Global competition leading to loss of manufacturing jobs in US. Companies must eliminate waste in order to reduce costs and become more responsive to customer needs
  - Greater pressure on companies to minimize environmental impact

International Drivers for Clean

- WEEE Directive
  - Requires producers of electrical and electronic equipment to finance collection arrangements for their products at the end-of-life
- RoHS
  - Restricts use of lead, mercury, cadmium, hexavalent chromium, polybrominated biphenyls (PBBs), and polybrominated diphenyl ethers (PBDEs)

Clean Success
Case Study #1

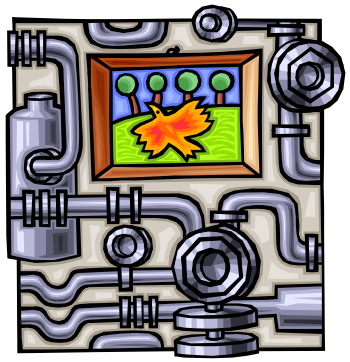


Company:

Manufacturer of high-end brass hardware for kitchen and bath cabinets.

Rework and scrap in the plating and clear coating department was identified as a bottleneck and very costly.

Case Study #1



The Clean Solution

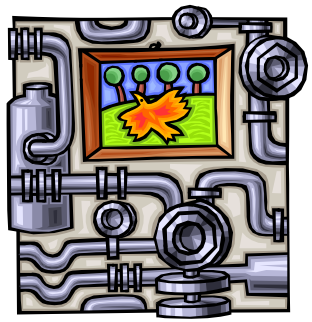
- **Recommendations**

  Worked with the company to develop process control standard procedures in the plating and coating departments.

- **Results**

- Increased production rates from 112,000 to 116,400 per month
- Cut process water from 5,500 to 3,700 gallons/day
- Decreased chemical costs through improved bath maintenance
- Reduced hazardous waste generation – less product being stripped

Clean Success
Case Study #2



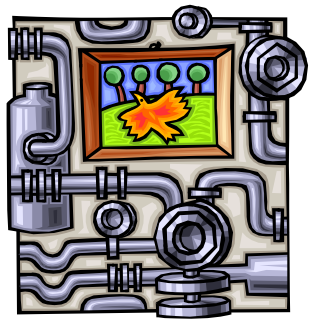
Company:

Company manufactures non-ferrous coax cabling, connectors, and antennas for the cell tower industry.

Company needed alternative packaging options to:

- Reduce lead and cycle time
- Protect the silver plated parts from tarnishing

Case Study #2



The Clean Solution

- Recommendations
  - New handling procedures to prevent tarnishing
  - Reusable packaging to eliminate need for plastic bags
- Estimated results
  - 600 hours/year of unpacking eliminated
  - 720,000 bags not being purchased and disposed

Green Suppliers Network (GSN) Program

- Provides Lean and Clean technical assistance to small and mid-sized manufacturers
- Expands the traditional Lean definition of waste from eliminating non-value added time, labor, money to include environmental wastes (energy, emissions)
- Key partners
  - US EPA
  - Manufacturing Extension Partnership (MEP)
  - OEMs and its suppliers

OEMs

- Healthcare/Pharmaceutical
  - Baxter Healthcare, Pfizer, Johnson and Johnson, Bristol-Myers Squibb, Abbott, Wyeth and Roche
- Automotive
  - General Motors, Daimler/Chrysler
- Aerospace
  - UTC, Northrop Grumman, Raytheon, Pratt & Whitney, Lockheed-Martin, Boeing, GE Aircraft Engines
- Office Furniture
  - Herman Miller, Steelcase, Hon AllSteel, Haworth, Kimball, Light Corp.
- Farm/Construction
  - John Deere
- AMTRAK
- Others
  - Appliances and Truck & Buses

Program Approach

- Top-level operational benchmarking assessment
- Value stream and process maps to identify sources of waste
- Facilitated opportunities sessions
- Full facility energy assessment (CT)
- Final report of opportunities with cost benefit analysis

Aerospace Results to Date

Project Activity Update	
Impact of Opportunities – Results Identified by 5 Completed Projects	
Cost Savings from Environmental Impact Opportunities	$1,325,841/yr
Energy Conservation (MM BTUs)	53,561
Water Conservation (Gallons)	3,329,459
Cost Savings from Lean Opportunities	$3,671,957/yr
Cost Savings from One-Time Business Opportunities	$1,840,825
Cost Savings from Other Opportunities	$124,222
Total Potential Cost Savings	**$5,122,020**

Project Costs

$7,000 Cost Of Review
$2,500 EPA Program Discount*
$4,500 Total Cost To Supplier For GSN Review

$2,500 CONNSTEP for CT defense suppliers
$2,000 Total Cost For GSN/DoD Review

$1,000 Credit Toward Implementation Assistance**

*Suppliers Must Qualify Under SBA Definitions
** Work must be coordinated within 3 months of facility review through 360vu provider

Why Successful?

- CEO/top management involved starting with Operational Assessment
- Facilitated team based activity
- Looks holistically at waste – not just lean measurements or P2 efforts
- Builds upon the operational improvements identified in the Review

New Haven EMS Project

- 1996 National Air Toxics Assessment identified New Haven County as the second highest in New England
- 2004 New Haven Community Clean Air Initiative identified surface coating and degreasing as one of the largest contributors of HAPs
- Plating, polishing and fabricated plate work accounted for ~22% of the total emissions inventory
- Partners – City of New Haven, EPA, CONNSTEP
- Received grant from EPA for EMS implementation

Why EMS?

- Puts infrastructure in place for compliance, pollution prevention, continuous improvement
- Looks at whole facility
- Puts the "E" in every ones job
- Sets objectives & targets for continuous improvement

New Haven EMS Project

- Interactive training sessions
- On-site assistance to develop or strengthen an existing EMS
- Focus on reducing the emissions

Questions?