



Improving the Economic and Environmental Performance of the North American Automotive Industry Supply Chain



Lean and Green Tools and Training



September 7, 2011
Spring Hill, Tennessee



Greening Automotive Supply Chains

A Review

- Started here in Spring Hill, Tennessee
- Origin of the Suppliers' Partnership for the Environment organization
- Collaborative effort between USEPA and the Manufacturing Extension Partnership Program of the U.S. Department of Commerce
- Expands lean definition of waste to include environmental considerations: *Lean and Clean Advantage*
- Hands-on training on shop floor





Combining Lean and Green

Traditional “Lean” Eliminates...

- **D**efects
- **O**verproduction
- **W**aiting
- **N**on-utilized resources
- **T**ransportation
- **I**nventory
- **M**otion
- **E**xtra processing

“Clean” adds...

- **F**ull use of Raw Material
- **E**nergy Efficiency
- **W**ater conservation
- **E**liminating Toxic Material
- **R**eduction of:
 - Packaging Wastes
 - Emissions to Air and Water
 - Solid & Hazardous Wastes
 - Regulatory obligations and risks





Learning to see “Green”

Traditional “Lean” Eliminates...

- Defects
- Overproduction
- Waiting
- Non-utilized resources
- Transportation
- Inventory
- Motion
- Extra processing

“Clean” adds...

- Full use of Raw Material
- Energy Efficiency
- Water conservation
- Eliminating Toxic Material
- Reduction of:
 - Packaging Wastes
 - Emissions to Air and Water
 - Solid & Hazardous Wastes
 - Regulatory obligations and risks



**GREEN SUPPLIERS
NETWORK**



MEP • MANUFACTURING
EXTENSION PARTNERSHIP





The Value of Lean AND Clean

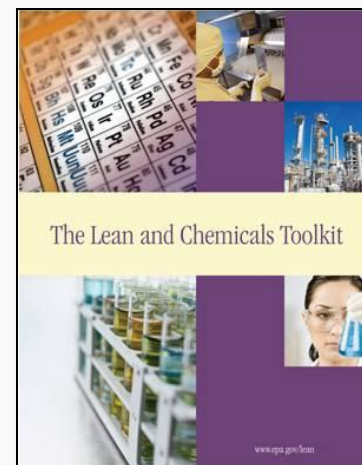
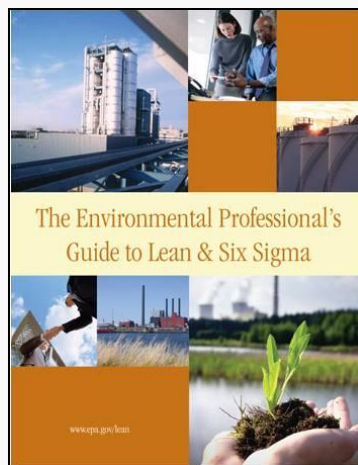
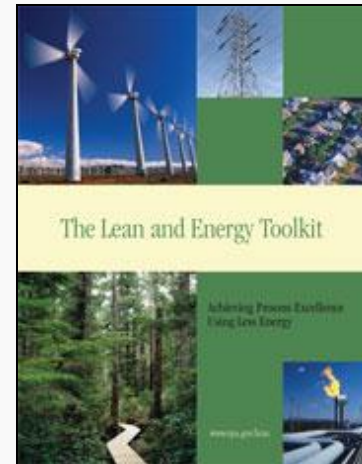
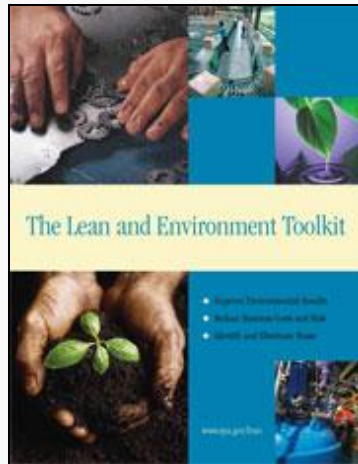
Cost Savings from Environmental Impact Opportunities	<u>\$35,979,115/yr</u>
Energy Conservation (MM Btu)	2,956,765
Water Conservation (gallons)	98,600,949
Water Pollution Reduction (lbs)	21,301,320
Air Emissions Reduction (lbs)	7,224,261
Solid Waste Reduction (lbs)	31,090,186
Cost Savings from Lean Opportunities	<u>\$41,055,373/yr</u>
Cost Savings from Other Opportunities	\$2,300,000/yr
Total Potential Cost Savings	\$79,334,488/yr

Results for 166 reviews





EPA's Lean & Environment Toolkits





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GREEN SUPPLIERS NETWORK

Welcome to the Green Suppliers Network

As a manufacturer, you work hard to keep costs down, profits up, and your customers happy. But can you stay competitive and reduce your environmental footprint at the same time? The answer is yes.

By partnering with the Green Suppliers Network, you will learn lean manufacturing techniques coupled with sound environmental strategies, which we call the *Lean and Green Advantage*.

GREEN SUPPLIERS NETWORK

What Industry Is Saying – Steelcase

Mary Ellen Mika, Supply Chain Manager



[Green Suppliers News](#)

[Materials Handling World Magazine - HFT Forklifts sign up to Green Achiever scheme](#)

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Green Suppliers Network is a joint effort of the U.S. Environmental Protection Agency and the U.S. Department of Commerce, National Institute of Standards and Technology, Manufacturing Extension Partnership Program. The Green Suppliers Network is a component of the E3 Initiative.

www.greensuppliers.gov



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Green Suppliers Network Training

Welcome to the Green Suppliers Network Review Team Online Training Course

This online training course was developed to help you prepare for the Green Suppliers Network technical review. The course will explain the *Lean and Green Advantage*, demonstrate value stream mapping techniques, and introduce you to tools that capture real results.

The training course modules contain videos and exercises to help you see how the Green Suppliers Network review process is put into practice. At the end of each module, you will find a brief quiz, which you must complete in order to receive a certificate of course completion. If you are a new Review Team participant and have never conducted a Green Suppliers Network technical review, you must complete this course and submit your certificate of completion to EPA prior to conducting the onsite review. We also encourage you to use parts of this training in your own presentation to suppliers.

If you have any questions or comments about the Online Training Course, please contact: green_suppliers@epa.gov.

[Start Course](#)

[Course Training Home](#)

[Module 1: Lean and Green Basics](#)

[Module 2: The Review](#)

[Module 3: Value Stream Mapping](#)

[Module 4: Measuring Results](#)

[Certificate of Completion](#)

[Course Index](#)





Building Infrastructure & Training Trainers

- Taller “Manufactura Esbelta y Limpia (Lean & Clean) Tecnológico De Monterrey
- October 27-29, 2008
- Ford Motor Plant in Chihuahua
- Instructors:
 - Kurt Middelkoop, Texas MEP
 - Julio Lugo, Puerto Rico MEP



What is E3?

A model for collaboration among manufacturers, utilities, local government, and federal resources intended to:

- Invest in local communities
- Address energy and sustainability challenges
- Provide valuable technical training and assessments
- Enable economic growth and job creation



E3 – Federal Programs Working Together



**DOC NIST
Manufacturing
Extension
Partnership**

**DOE Industrial
Technologies
Programs and IAC**

**MEP and EPA Green
Suppliers Network**



**EPA Pollution
Prevention and
Climate Leaders
Programs**

**DOL Employment
and Training**

**SBA and its Small
Business
Development
Centers**





- About E3
- E3 on the Ground
- Put E3 in Action
- Accomplishments
- More on Sustainability

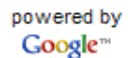
Welcome to **E3: Economy, Energy and the Environment**—an initiative designed to help you thrive in a new business era focused on sustainability and, working together, to promote sustainable manufacturing and economic growth throughout the United States.

Working together within the E3 framework, we can:

- BOOST** local economies
- DRIVE** innovation
- INCREASE** manufacturing productivity
- FOSTER** development
- REDUCE** environmental impacts
- CONSERVE** energy and resources

- Project Framework**
- Frequently Asked Questions**
- Leveraging Resources**
- Tools and Materials**
- Tell Me More!**

Sustainable Manufacturing in the News | Milwaukee Small Business Times (blog) - Green is the new gold for Wisconsin manufacturers



Technical Assessment

A **Lean Review** which leads to increased productivity and reduced costs

An **Energy Assessment** which provides tools and insight to reduce energy demand and costs

A **Greenhouse Gas (GHG) Evaluation** that teaches manufacturers how to calculate GHG emissions and evaluate reduction strategies

A **Clean Review** which results in water and energy conservation, reduced emissions, and additional cost savings

Post-Assessment Recommendations that guide each facility toward improvements in overall efficiency, reduced waste, more efficient use of resources including energy and water, and cost savings

Implementation Support

SBA and its **Small Business Development Centers (SBDCs)** provide business excellence counseling services and financing through guaranteed loan programs

DOL and its **Workforce Investment Boards** provide green job and skills training and apprenticeships supported by workforce development and training grants

Local and Regional E3 Team provides additional resources and support such as utility incentives, state recognition, internship programs and local funding and grant opportunities



EPA Climate Leaders Tools

Climate Leaders Tool	Description	Projected Dates
Annual GHG Inventory Summary and Goal Tracking Form	Easy to use spreadsheet that helps track GHG inventory values and goal progress	2011
Inventory Management Plan (IMP) Template and Checklist	Instructional document that helps inform users of critical elements for GHG inventory development and management	2011
EPA eGRID Emissions Factor zip code tool	Simple, time-saving tool that allows users with many facilities to quickly populate eGRID factors into inventory	2011
Consolidated Emissions Factor “Hub”	A “one-stop shop” for emissions factors	2011
Enhanced EPA Simplified GHG Calculator	A revised, simple and free “turbo-tax” GHG calculator for business of all sizes	2011
GHG Goal Setting Model and Guidance	An easy-to-use, publicly available benchmarking model that allows companies across the U.S. economy to set a GHG goal that goes beyond business as usual for their sector	2011

E3 Metrics

Economic Metrics:

- Environmental savings identified
- Lean savings identified
- Other cost savings
- One time potential cost savings identified
- Individuals trained
- Jobs created
- Jobs retained
- Total annual potential impact identified
- Number of small businesses engaged
- Percentage of small businesses engaged
- Number and value of SBA loans granted
- Capital infusion dollars invested
- Hours of counseling provided

Energy Metrics:

- Energy conserved (MM BTU/kWh)
- Energy intensity per unit of production
- Carbon reductions (tons)
- Carbon intensity per unit of production

Environment Metrics:

- Air emissions reduced (lbs)
- Solid waste reduced (lbs)
- Material intensity per unit of production
- Hazardous waste reduced (lbs)
- Hazardous materials reduced (lbs)
- Water pollution reduced (lbs)
- Water used/conserved (gal)
- Water intensity per unit of production



E3: ECONOMY • ENERGY • ENVIRONMENT

SUPPORTING MANUFACTURING LEADERSHIP THROUGH SUSTAINABILITY

Alabama E3

Supporting Sustainable Manufacturing in Alabama through Reducing Energy and Environmental Wastes, Reducing Costs and Improving the Workforce



Alabama Industrial Assessment Center

