

Supporting Sustainable Manufacturing in Indiana

E3: Economy, Energy, and Environment



Perry Stephens, CEM
16th Annual Pollution Prevention (P2)
Conference and Trade Show

Primo's West ~ Plainfield, IN
October 25 – 26, 2013



E3 is Federal Programs Working Together



**DOC NIST
Manufacturing
Extension
Partnership**

**DOE Industrial
Technologies
Programs**

**DOC NIST MEP
EPA Green
Suppliers
Network**



**EPA Pollution
Prevention
Programs**

**DOL Employment
and Training**

**SBA Small
Business
Development
Centers**

**USDA Rural
Development**

Downloaded from <http://ajph.org/> on November 10, 2015



What is E3?

A comprehensive approach for establishing sustainable practices for manufacturers

- Coordinates local, state, and federal assistance to work with manufacturing base in local communities to enhance sustainability and competitiveness and to spur job growth and innovation.
- Provides manufacturers with customized, hands-on lean, energy and pollution prevention assessments, specific project implementation recommendations and customized workforce training in applicable “green” skill sets.
- Promotes sustainable manufacturing and growth through innovative technology and access to affordable capital to support needed new systems/equipment.
- Improves the regional economy by retaining jobs in companies that are better positioned for global competition.
- Reduces environmental impacts while regaining a competitive advantage.

Bringing E3 to Indiana : Pilot

- Establish replicable, self-sustaining initiatives to increase the sustainability and profitability of local and regional manufacturers
- The pilot - E3 Indiana Program will focus initially on one or two manufacturers in the service territory of participating utilities.
- Harness *existing* federal, state and local expertise and resources
- Develop *new* sources of technical assistance, technology, expertise, and workforce development from federal, state and local resources to provide:
 1. Technical Assessments
 2. Project and New System Implementation Support
 3. Workforce Development and Support
- Develop the resource capability and justification to support a grant for a multi-year program.

Technical Assessments

A **Lean and Green Review** which leads to increased productivity and reduced costs, reductions in water use, materials and energy.

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.

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.

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 consulting 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 Model: Programs working together

ECONOMY

Purdue TAP (NIST - Manufacturing Extension Partnership), Small Business Administration (ISBDC), Workforce Investment Board, Duke Energy

ENERGY

Duke Energy, Purdue TAP, Indiana Office of Energy Development, U.S. EPA-Energy Star, U.S. Department of Energy - Industrial Assessment Center at IUPUI

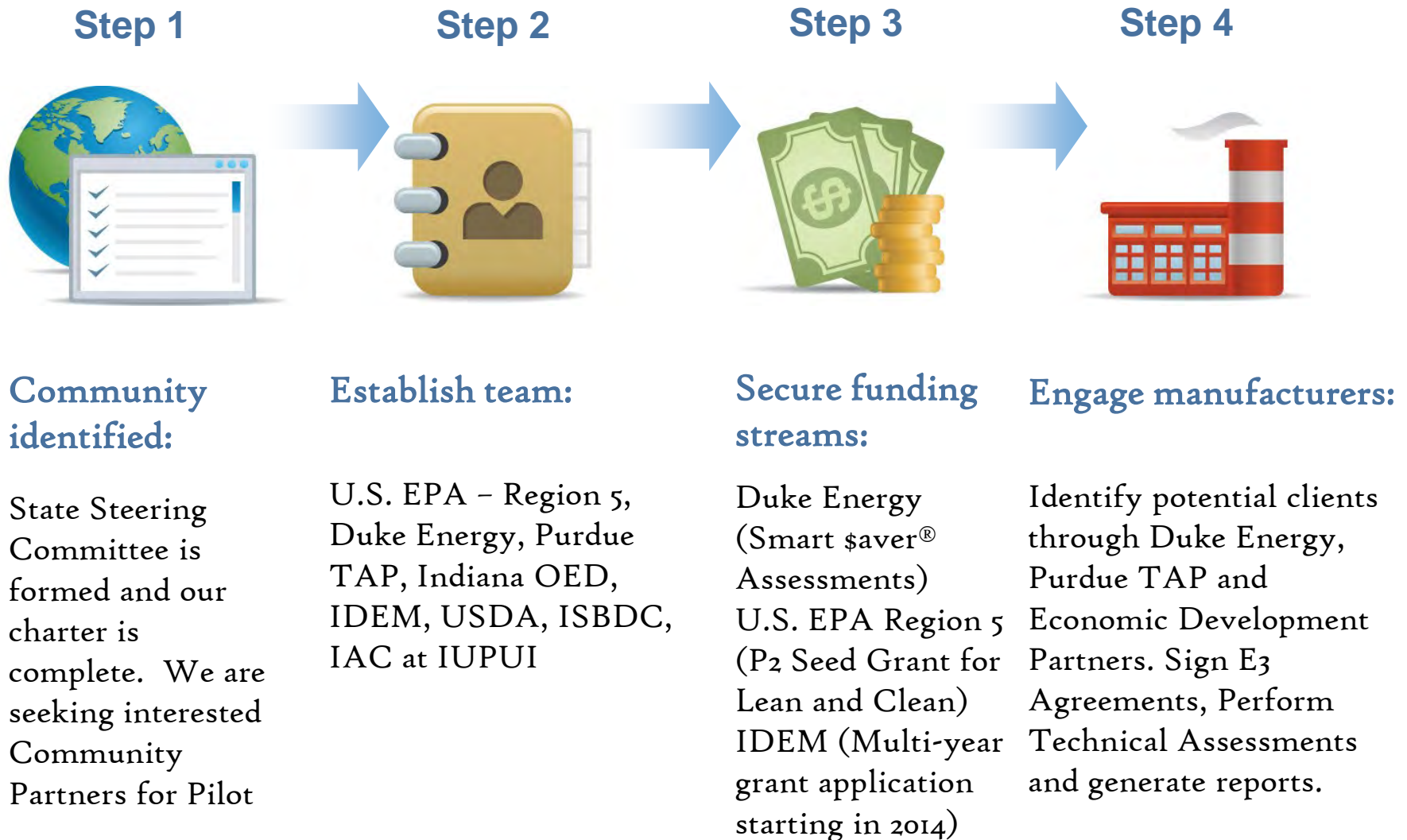
ENVIRONMENT

Indiana Department of Environmental Management, U.S. EPA, Purdue TAP

COMMUNITY

Local Economic Development and Regional Planning Commissions
U.S. Department of Commerce, U.S. Department of Agriculture

E3 Indiana Progress



E3: At A Duke Energy Customer



Project Goals:

- Increase energy efficiency and sustainability;
- Provide valuable technical training, jobs and skills training, assessments and support for E3 clients;
- Improve profitability and competitiveness of a South Carolina manufacturer;
- Create and retain manufacturing jobs.

Project Activities:

- **A Lean Review** that leads to increased productivity and reduced costs (SC MEP)
- **An Energy Audit** that provides tools and insights for reducing energy demand and costs (Duke Energy/PETRA)
- **A Pollution Prevention Assessment** that results in water and energy conservation, reduced emissions, and additional cost savings (SCDHEC)

Summary of Prioritized Recommendations

First Tier Priority Recommendations

- Take Steps to be a “Best in Class Manufacturer” to guard market share erosion by other “LEAN” players.
- Adopt Implement a Quality Management System
 - and an Environmental Management System based on ISO 9000 & 14001 Certifications
- Set Zero Waste to Landfill Goal

Second Tier Recommendations

(Key Assessment Areas)

Lean Assessment:

- Inventory reduced from 161 days to 60 days
- Eliminate the need for air testing saving 30 seconds/units at 200 units per day.
- Quality on missing parts and incomplete paperwork improved by 34%
- Non-value added time from 164.3 to 60 days
- Lead time on raw materials delivery reduced from 6 minutes to 30 seconds

Energy Assessment:

- Change out Assembly & Manufacturing Lighting
- Installing variable frequency drives on Coolant loop pumps
- Installing Infrared Controls on Ovens
- Modify Production Schedule to utilize time of use rate.

Summary of Energy Assessment

Recommendations

Recommendations	Conservations (/year)	Savings (\$/year)	Duke Energy's Incentive (\$)	Implementati on Cost (\$)	Simple Payback (years)
Assembly Lighting	38,154 kWh	1,988	1,1719	8,605	3.5
Mfg. Lighting	228m471 kWh	11,933	6,188	33,514	2.3
VFD pumps	23,000 kWh	1,208	1,427	9,510	6.7
Modify Assembly Schedule, Off – Peak	o	51,650	o	N/A	N/A
Total	806,625 kWh	\$92,624	\$15,790	\$93,004	0.8

Second Tier Recommendations (Continued)

Green/Environmental Assessment:

- Set up a Green Team or a Pollution Prevention Team
- Implement an Environmental Management System
- Better control of recyclables to prevent contamination of other materials and better price of materials
- Set up office recycling program
- Recommend using *Design for the Environment* Floor Cleaners
<http://www.epa.gov.dfe/>
- Shredded unusable cardboard and reuse as packing material for finished product
- Replace wipes used to wipe down parts before painting operations with a steam cleaning unit
- Purchase reusable pallets
- Use reusable cups
- Recycle masking tape
- Analyze grinding sward to determine break down of materials
- Use reusable rags in painting operations
- Opportunity for compliance assistance

Summary of Green Assessment

Recommendations

Recommendations	Conservations (/year)	Savings (\$/year)	Implementati on Cost (\$)	Simple Payback (Months)
Implement Environmental Management System		7,500	15,00	24
Implement <i>Zero Waste to Landfill</i> Goal	102 Tons/year	\$3,500	500	7
Shredded unusable Cardboard and reuse as packing materials			\$7,000	10 days
Purchase reusable pallets	213.8 Tons/year	\$2,00	N/A	N/A

- **Smart \$aver® Program Incentives**

- Energy Efficiency Assessments
- Cash incentives for installing energy conservation measures
 - Prescriptive
 - Custom
- Energizing Indiana rebates may apply.

- **PowerShare® Demand Response**

- Bill credits for helping us manage our peak load on hottest days of the year



Smart \$aver® Program



- Assessments
 - Identify ways your company can save energy, reduce bills, become greener.
- Cash incentives for installing energy conservation measures
 - Lighting
 - Food service
 - HVAC and controls
 - Motors, pumps and drives
 - Most other energy saving projects



Since 2009,
Duke Energy has
paid out over
\$12 million
in incentives



Saving customers
over
\$11 million
in annual energy
costs

Contacts for Indiana E3

Rick Bossingham
Indiana Department of
Environmental Control
rbossing@idem.IN.gov

Christina Guthrie
U.S. EPA, Pollution Prevention
Guthrie.Christina@epa.gov

Jacob Schpok
Indiana Economic Development
Council
JSchpok@iedc.IN.gov

Scott Hutchins
U.S. Department of Energy
scott.hutchins@hq.doe.gov

Perry Stephens
Duke Energy
perry.stephens@duke-energy.com

Kerry Vestile
Duke Energy
kerry.vestile@duke-energy.com

Jie Chen
IUPUI – IAC
jchen3@iupui.edu

John Coy
Purdue - TAP
jpcoy@purdue.edu

Dan Lilley
U.S. Dept of Commerce, NIST-MEP
dlilley@nist.gov

Questions ???

Contact Information:

Contact your **Duke Energy Account Manager**

or

Perry Stephens, CEM

Duke Energy| Manufacturing Segment Manager

Business Customers ~ Market Strategy

o: 864-439-5957 | c: 864-546-1287

www.duke-energy.com