Technical Assistance Approaches for E2 Energy Efficiency

Cam Metcalf, Executive Director

NEWMOA Webinar
May 26, 2009

KPPC
Kentucky's Resource Center for Environmental Sustainability

UNIVERSITY OF LOUISVILLE
J.B. SPEED SCHOOL OF ENGINEERING

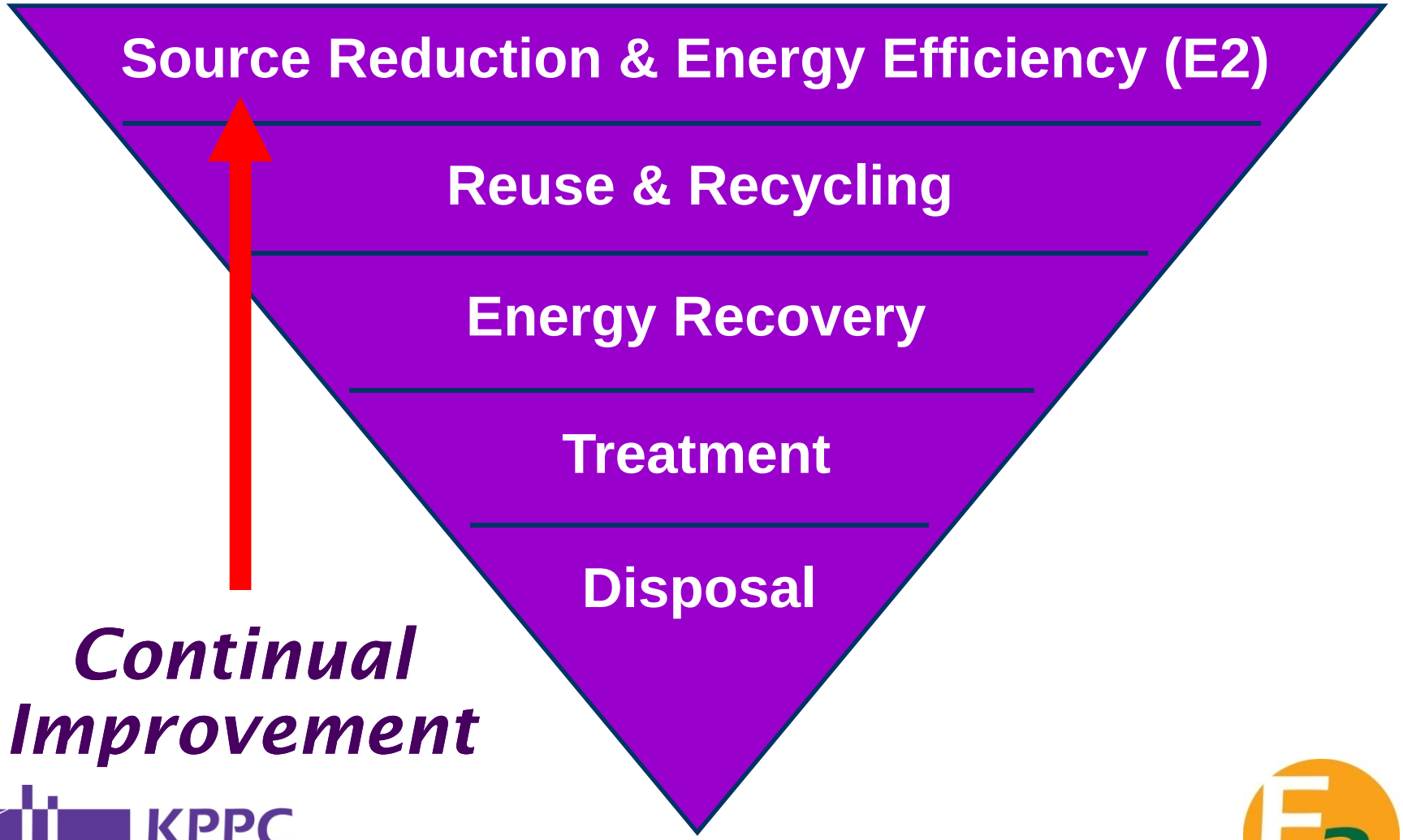
P2 = Source Reduction

- **P2 means "Source Reduction" <u>and other practices</u> that reduce or eliminate the creation of pollutants through:**
  - ✓ **increased efficiency in the use of raw materials, energy, water or other resources, or**
  - ✓ **protection of natural resources by conservation.**

Resource Management

KPPC
Kentucky's Resource Center for Environmental Sustainability

Proactive Planning: Move Up the Hierarchy



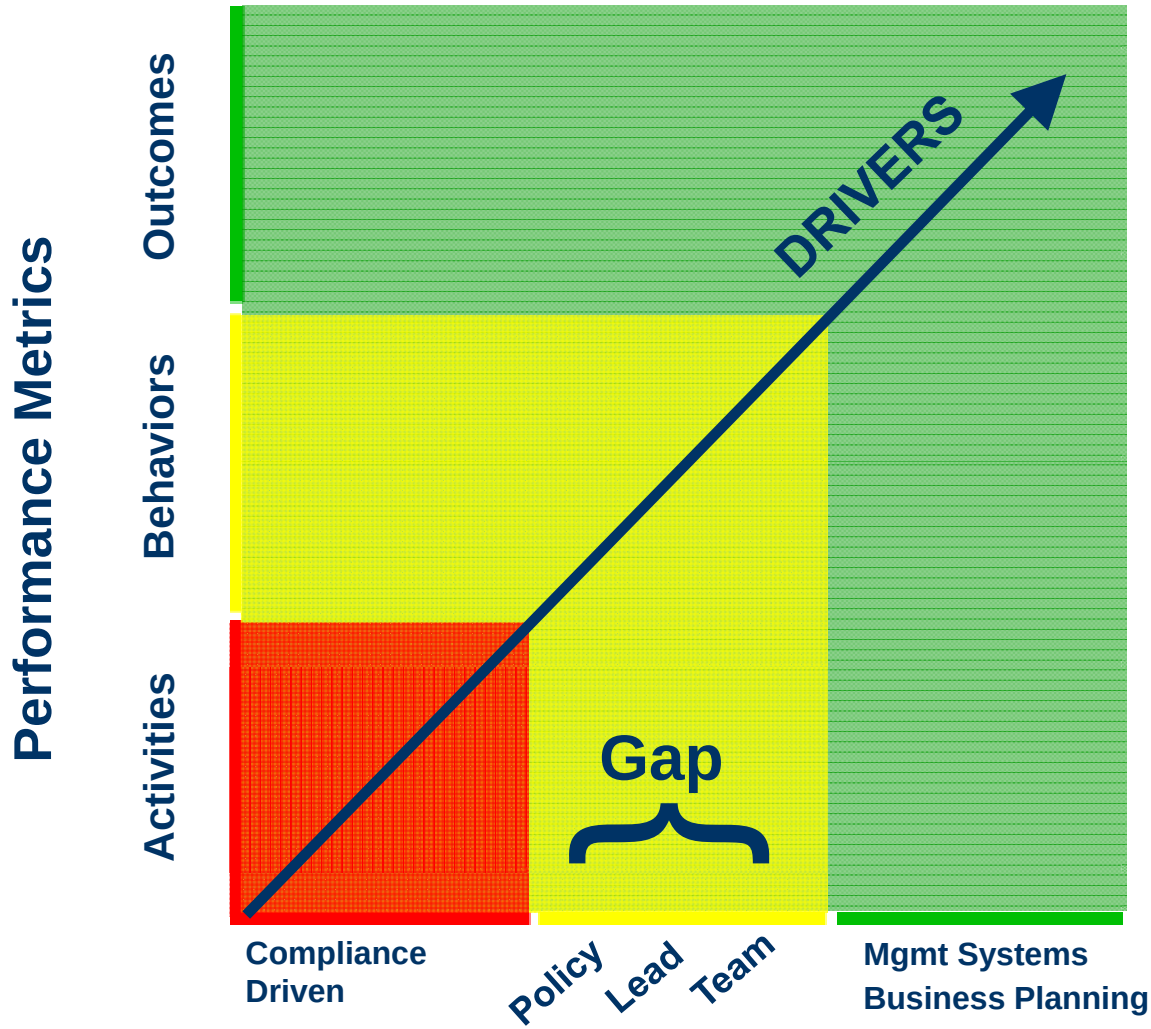
KPPC
Kentucky's Resource Center for Environmental Sustainability

"Cultural Technology"

- ✓ **Some client's organizations are not ready to explore & implement new E2 technologies or practices**
- ✓ **Calibrate with the client at the outset**
- ✓ **EMP allows organizations to successfully address, demonstrate & deploy profitable environmental & energy solutions**
- ✓ **7-step process provides internal structure for transition from reactive to proactive**

KPPC
Kentucky's Resource Center for Environmental Sustainability

Organizational Capability

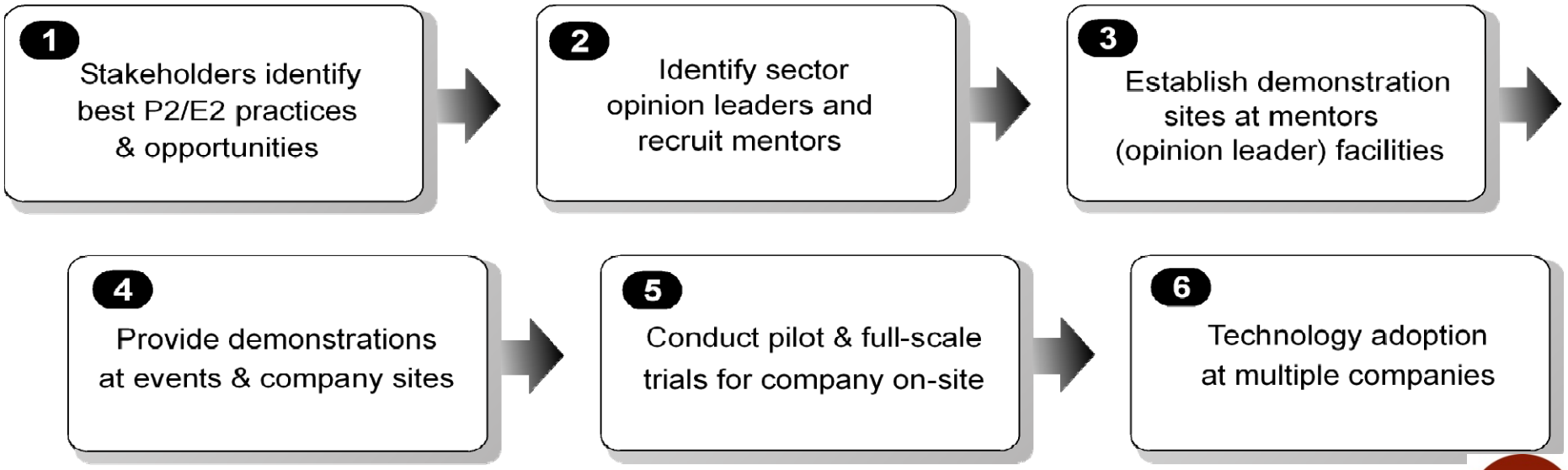


KPPC
Kentucky's Resource Center for Environmental Sustainability

Improve Market Conditioning

- **No "buy in" for P2/E2 technologies being "pushed" upon companies with an "unnecessary" additional cost**
- **TDI marketing is "pull" approach that probes industry leaders & experts for their needs, viewpoints & demands**
  - ✓ **Stakeholder groups are a powerful tool**

Figure 1 ADOP^{2}T^{TM} Program Process Map



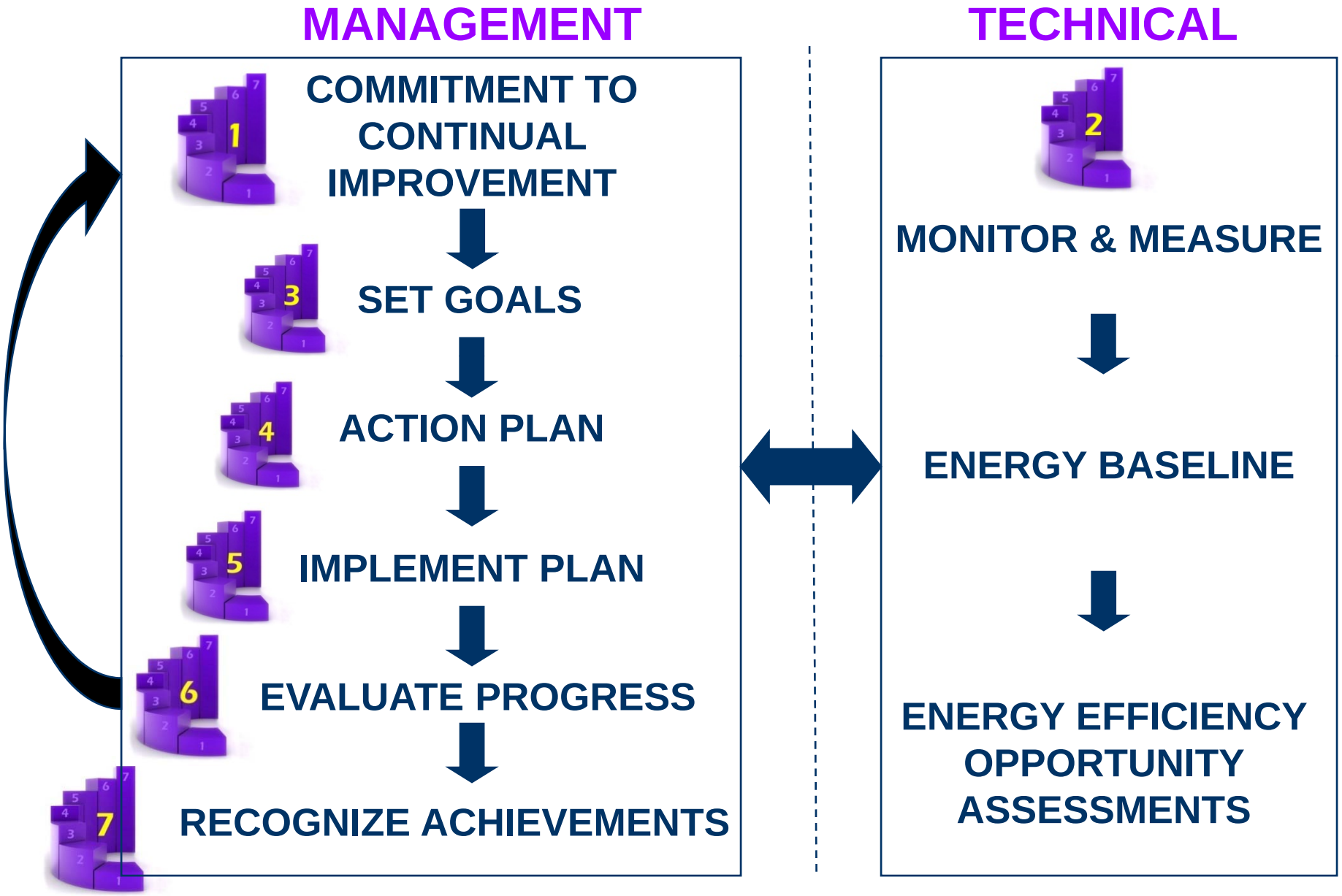
TDI Strengths for TAPs

- Good approach for scoping out new projects that will result in a higher implementation rate
- Most companies do not have the technical savvy or time to evaluate P2/E2 technologies
- Opinion leaders can “test drive” P2/E2 technologies before committing to full implementation & large capital investment
- Demonstrations help companies develop an understanding of what the technology can do and how it works in a real world situation

KPPC
Kentucky's Resource Center for Environmental Sustainability

TDi

EPA's Energy Star 7-Step EMP



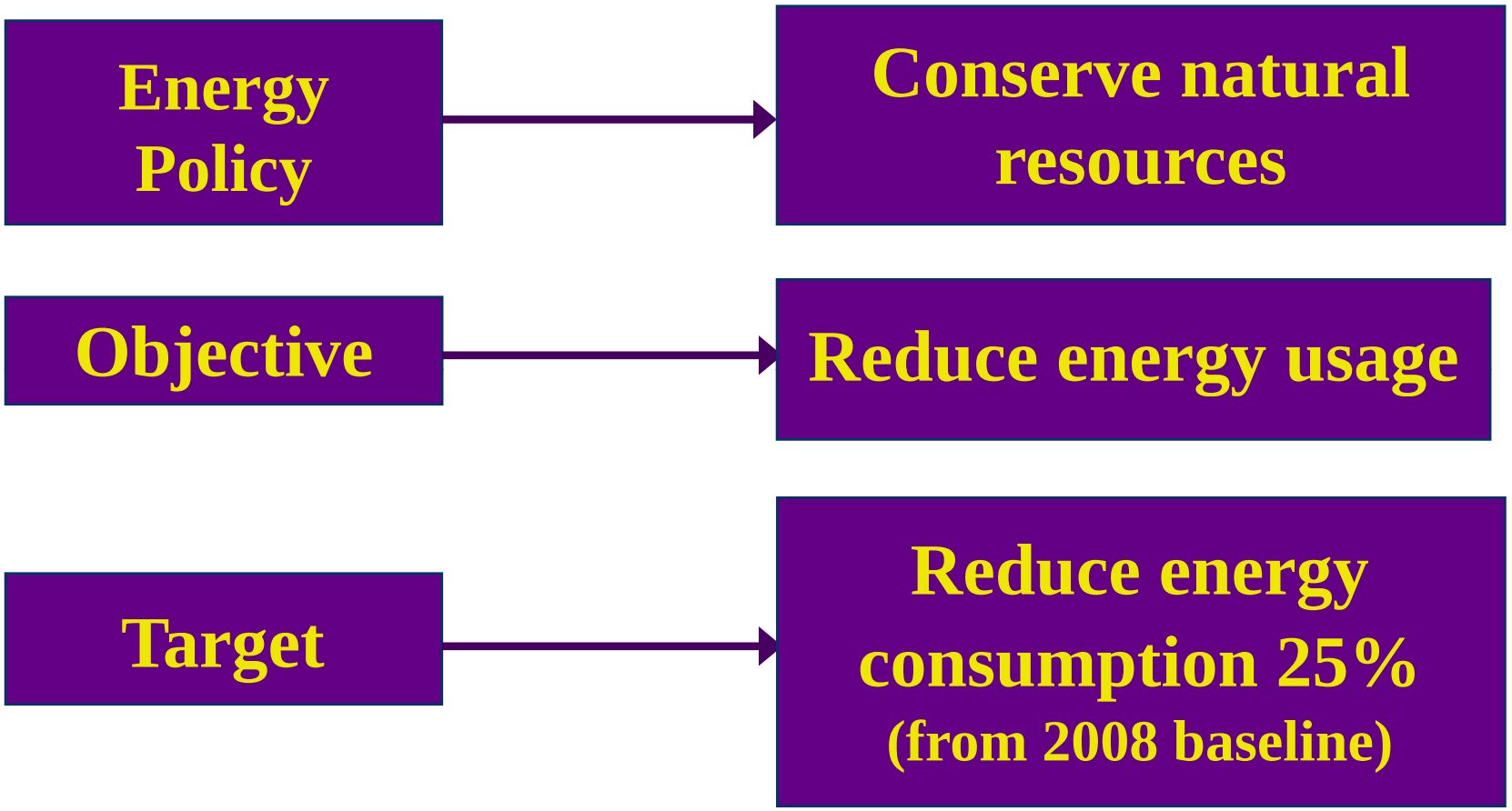
EPA's Energy Star 7-Step Energy Management Process (EMP)

Make Commitment to Continual Improvement

- ✓Policy
- ✓Appoint Energy Team
- ✓Appoint Team Leader

KPPC
Kentucky's Resource Center for Environmental Sustainability

The Policy Drives Objectives & Targets



Environmental performance – measurable results based on the policies, objectives & targets!

KPPC
Kentucky's Resource Center for Environmental Sustainability

Adopt a Team Approach for EMP

- Advising, coordinating & facilitating EMP implementation
- Completing EMP tasks & general responsibilities
- Gathering, organizing, evaluating & disseminating EMP information
- Developing EMP procedures (Controlled Processes)
- Representing all functional areas of the organization
- Managing the reactions to changes resulting from EMP implementation

Team Leader to Drive Implementation

- **EMP Implementation**
  - ✓ **Written Plan**
  - ✓ **Plan Schedule**
- **Plan Execution**
  - ✓ **EMP Implementation Team meetings**
  - ✓ **Management review meetings**

KPPC
Kentucky's Resource Center for Environmental Sustainability

EPA's Energy Star 7-Step Energy Management Process (EMP)

Make Commitment to Continual Improvement

- ✓Policy
- ✓Appoint Energy Team
- ✓Appoint Team Leader

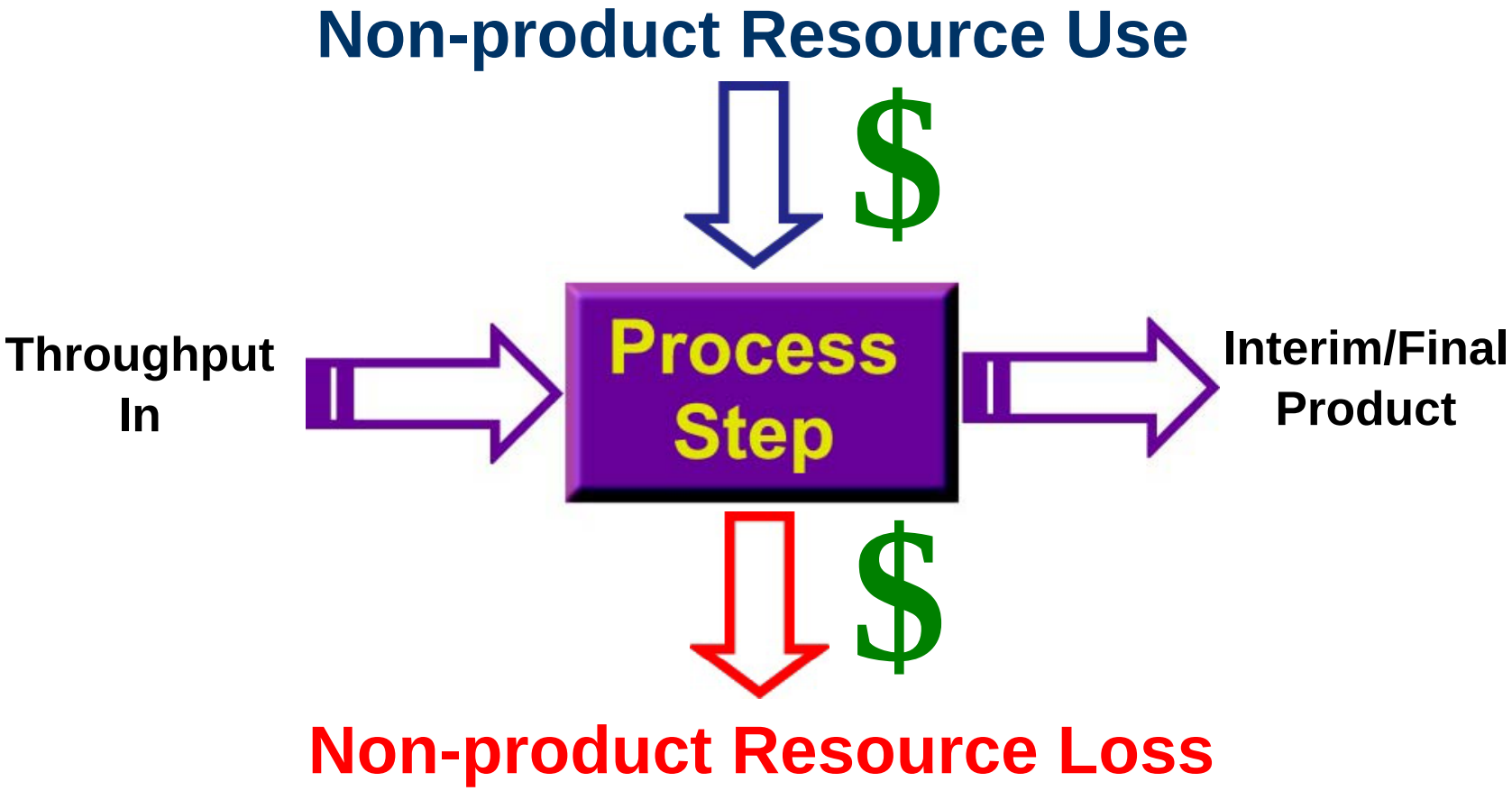
Assess Performance & Opportunities

- ✓Track & monitor energy use & costs
- ✓Develop baseline (& benchmark)
- ✓Identify E2 opportunities

KPPC
Kentucky's Resource Center for Environmental Sustainability

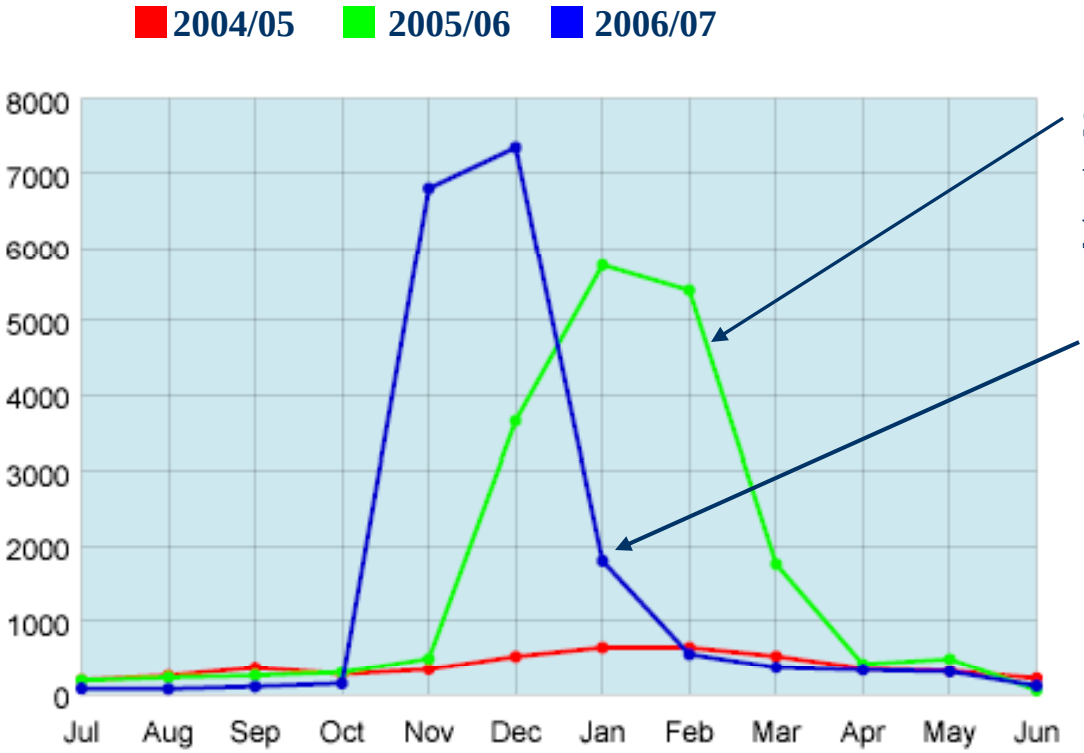
E2

Resource Accounting



KPPC
Kentucky's Resource Center for Environmental Sustainability

You Can't Manage What You Don't Monitor



$23,500 more than the previous year

Equipment Checked and Reset. Gas Bill $5,000 less than previous month

Elementary School Natural Gas Usage

KPPC
Kentucky's Resource Center for Environmental Sustainability

KEEPS

Benefits of Energy Balance

- Determine which processes to concentrate efforts on for reducing & eliminating energy usage
- Establishes a baseline over which efficiency improvements can be tracked & benchmarked
- Effective tool to determine & compare economic feasibility of various energy use improvement strategies

Identify E2 Opportunities & Solutions

- Review information acquired
- Technically feasible
  - ✓ Will it work and/or change other operations?
  - ✓ Special considerations?
- Economically feasible (financial protocol)
  - ✓ Simple payback
  - ✓ Internal Rate of Return (IRR)
  - ✓ Return on Investment (ROI)

KPPC
Kentucky's Resource Center for Environmental Sustainability

Ranking E2 Opportunities

- **Team evaluates & prioritizes the opportunities identified**
- **Typical evaluation criteria include:**
  - ✓ **Feasibility of implementing goal (easy to hard)**
  - ✓ **Cost**
  - ✓ **Environmental impact(s)**
  - ✓ **Effort requirements (responsible team is identified for each objective & target)**
  - ✓ **Impact to Company mission**
- **Decision matrix or Bubble-Up/Bubble-Down**

Energy Management Process

Set Goals

- ✓Performance goals
- ✓Clear & measurable goals
- ✓Guide daily decision-making

Goals that:

- ✓Drive energy management activities
- ✓Promote continuous improvement
- ✓Drive effective short-term & long-term strategies
- ✓Require tracking & measuring of progress
- ✓Reap financial gains

KPPC
Kentucky's Resource Center for Environmental Sustainability

E2

Goals, Objectives & Targets

- **Objectives – overall environmental goals an organization sets out to achieve (attainable)**
  - ✓ **Develop procedures & work instructions to *Control* processes**
  - ✓ **Develop programs to *Improve* processes**
  - ✓ **Develop programs to *Investigate* feasibility for improvements**
- **Targets – set performance requirements to achieve the environmental objectives (reasonable)**
  - ✓ **Reduce energy use 5% compared to baseline year**
  - ✓ **Reduce energy use by 100 MMBtus per widget produced**

Energy Management Process

Set Goals

- ✓Performance goals
- ✓Clear & measurable goals
- ✓Guide daily decision-making

Create Action Plan

- ✓Roadmap to improve energy performance
- ✓Ensures a systematic process
- ✓Regularly updated to reflect achievements

KPPC
Kentucky's Resource Center for Environmental Sustainability

E2

Action plan should:

- Identify person & job responsibilities for ensuring plans completion (define roles & provide authority)
- Identify specific activities (tasks & sub-tasks)
- Set deadlines for each of the identified activities/tasks

Energy Management Process

Implement Action Plan

- ✓Investigate & verify E2 options
- ✓Develop & justify capital investment
- ✓Identify resources
- ✓Develop a timeline

Evaluate Progress

- ✓Review energy use data & activities
- ✓Compare effectiveness to performance goals
- ✓Document “best practices”
- ✓Create new action plans
- ✓Set new performance goals

KPPC
Kentucky’s Resource Center for Environmental Sustainability

E2

Energy Management Process

Recognize Achievements

- ✓Facility, team & individuals
- ✓Energy use & cost reductions
- ✓Emissions/pollution reductions
- ✓EPA's Energy Star Program

ENERGY STAR PARTNER

KPPC
Kentucky's Resource Center for Environmental Sustainability

E2

Program Success (05 – 09)

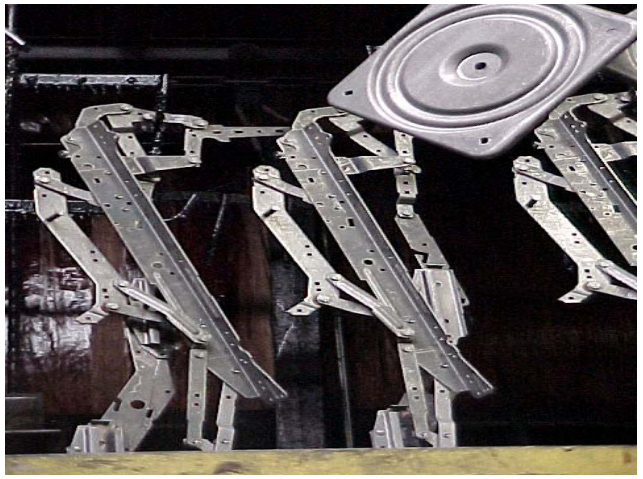
- ✓ **Cost avoidance using no cost/low cost measures - $475,500**
- ✓ **Cost avoidance with High Performance Schools - $299,582**
- ✓ **Cost avoidance from ESPC (5 months) – $230,000**

Total Cost Avoidance = $1,005,082

Low Temperature Conversion Coating

Manufacture of Reclining Chair Parts

- **Previously used high temperature multi-step phosphated process**
- **Successfully trialed single step non-phosphated experimental material at ambient temperatures**
  - ✓ **Reduced H_2O usage from 93,000 g/yr to 13,000 g/yr or ~ 86% (NO DRAINS)**
  - ✓ **No sludge technology/minimize solid waste**
  - ✓ **Tank life extended from 7 wks. to 18 wks.**
- **Substituted water-based paint (cures @ 225^{O}F) for solvent-based paint (cures @ 325^{O}F)**
- **Saved $200,000 in energy (2005 prices)**
- **Improved quality performance**



Processed parts to paint

Cross hatch adhesion test

KPPC
Kentucky's Resource Center for Environmental Sustainability

EPA WATER EFFICIENCY LEADER AWARD

PROGRAM SUMMARY	GALLONS	POUNDS	KWHs	MM BTUs	DOLLARS
WATER					
Water Use Reduce Gallons	2,128,688,200				
$ Savings Meter & Sewer $$					$1,431,727
CHEMICALS					
WWT Chemical LBS. Savings		175,200			
Other Chemical LBS. Savings		2,256,170			
$ Chemical Savings $$					$411,955
ENERGY					
Electricity = KWH			5,552,401		
Natural Gas = BTUs MM				131.87	
$ Energy Savings $$					$1,133,966
WASTE					
Solid Waste LBS.		5,107,300			
Liquid Waste Reduce Gallons	30,513,600				
$ Waste Savings $$					$433,050
SAVINGS & INCOME					
$ Other Savings $$					$671,643
$ Income Produced $$					$16,987
OUTCOMES =	2,159,201,800	7,538,670	5,552,401	131.87	$4,099,328
	GALLONS	POUNDS	KWHs	MM BTUs	DOLLARS

http://louisville.edu/kppc/keeps/emp-7-steps

Most Visited Getting Started Latest Headlines WAVE - Web Accessibi...

Energy Management Process (EMP) Seven Steps

KEEPS Kentucky Energy Efficiency Program for Schools

The seven-step Energy Manage
KEEPS participants. This syste
process of energy management
their organization and the envi

Each of the individual steps co
Management and additional res

Many of the additional resourc
members. Other materials, such
by KPPC energy efficiency engi

The seven step process as outli
Energy efficiency outcomes wil

The Seven Step Process

Step One:	Make the Co
Step Two:	Assess Performance & Opportunities
Step Three:	Set Performance Goals
Step Four:	Create an Action Plan

The Seven Step Process

Step One:	Make the Commitment
Step Two:	Assess Performance & Opportunities
Step Three:	Set Performance Goals
Step Four:	Create an Action Plan
Step Five:	Implement the Action Plan
Step Six:	Evaluate Progress
Step Seven:	Recognize Achievement

			1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30			

Upcoming Events

KREC Competitive Grants Program Research Webinar

Upcoming events...

News

Celebrate Earth Day 2009
Mar 26, 2009

Kentucky Industrial Materials Exchange (KIME)

KPPC Partnerships

Keys to Success

- **KPPC Commitment:**
  - ✓**"Readiness" training, data gathering & review**
  - ✓**Opportunities E2 assessment using tools**
  - ✓**Facilitate site E2 assessment with energy team**
  - ✓**Confidential services**
- **CLIENT Preparation AND Commitment:**
  - ✓**Policy, Team & Leader commitment to program**
  - ✓**Pre & post measuring & monitoring**
  - ✓**Provide critical data to project**
  - ✓**Team & site assistance in E2 assessments**

KPPC
Kentucky's Resource Center for Environmental Sustainability

Winner 2008 National Pollution Prevention Roundtable's

Most Valuable P2 Program Award

(Awarded September 18, 2008)

The National Pollution Prevention Roundtable, a 501(c)(3) non-profit organization, is the largest membership organization in the United States devoted solely to pollution prevention (P2).

The mission of the Roundtable is to provide a national forum for promoting the development, implementation, and evaluation of efforts to avoid, eliminate, or reduce pollution at the source.

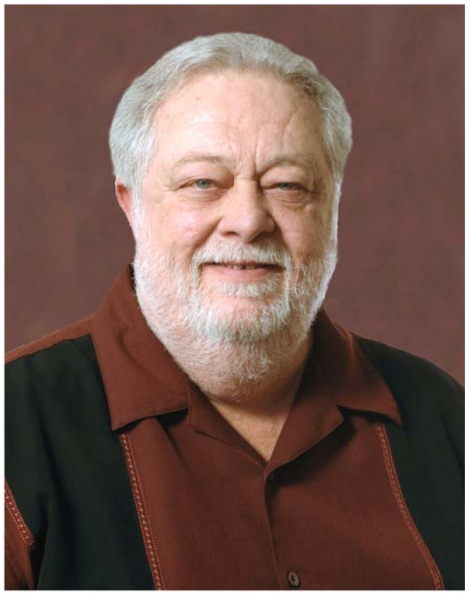
KPPC
Kentucky's Resource Center for Environmental Sustainability

UNIVERSITY OF LOUISVILLE
Green. It's Happening Here.

My Old Kentucky Home

KPPC
Kentucky's Resource Center for Environmental Sustainability

Questions & Comments



Cam Metcalf

Rebecca Cash

KPPC
Kentucky's Resource Center for Environmental Sustainability

KPPC Contact Info

Cam Metcalf ……..…cam.metcalf@louisville.edu

Kentucky Pollution Prevention Center (KPPC)
Shelby Campus, University of Louisville
Louisville, Kentucky 40292

Phone: (800) 334-8635 Ext. 8520965 or
(502) 852-0965

Fax: (502) 852-0964

MVP 2

EPA WATER EFFICIENCY LEADER AWARD

www.kppc.org

KPPC
Kentucky's Resource Center for Environmental Sustainability