Healthcare P2, E2 and EMS

Cam Metcalf,
Executive Director
Lissa McCracken,
Communication & Outreach Program Manager
Lisa Wease,
Training Coordinator

www.kppc.org

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Environmental Compliance Assistance Workshop for Kentucky Hospitals & Healthcare Facilities
June 1, 2007

The Big Squeeze is on!

There is a new global business environment!

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For Our "Universal Backyard"

- NIMBY
- NOTE
- BANANA
- CAVE
- NOPE

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What is KPPC?

- **The KY Pollution Prevention Center is a non-profit organization established in 1994 through legislative mandate**
- **Statewide technical assistance program**
- **Based at the *University of Louisville's* J.B. Speed School of Engineering**
- **Funding from companies that generate solid & liquid hazardous waste**
  - ⇨ **Hazardous Waste Assessment Fund (20%)**

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Kentucky Pollution Prevention Center

Mission

The Kentucky Pollution Prevention Center (KPPC) at the *University of Louisville* is Kentucky's primary resource for technical information and assistance to improve environmental performance.

The Center facilitates and promotes the proactive implementation of management systems and technologies to improve the competitiveness of businesses, industries and other organizations.

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KPPC's Services

- **Outreach & Training**
  - Workshops, teleconferences, CDs & manuals
  - Website at www.kppc.org

- **On-site assessments**
  - Pollution Prevention (P2)
  - Energy Efficiency (E2)
  - Environmental Management System (EMS)
  - 500+ over last 10 years (including 30 EMS & 55 E2)

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KPPC's Services

- **Recyclers List & Consultants List**
  - ✓ **www.kppc.org/publications/print materials**
- **Kentucky Industrial Materials Exchange (KIME)**
  - ✓ **Lists available & wanted materials for view & access on internet at www.kppc.org/kime**
- ***the BottomLine* Newsletter**
  - ✓ **Published quarterly – electronic copy**

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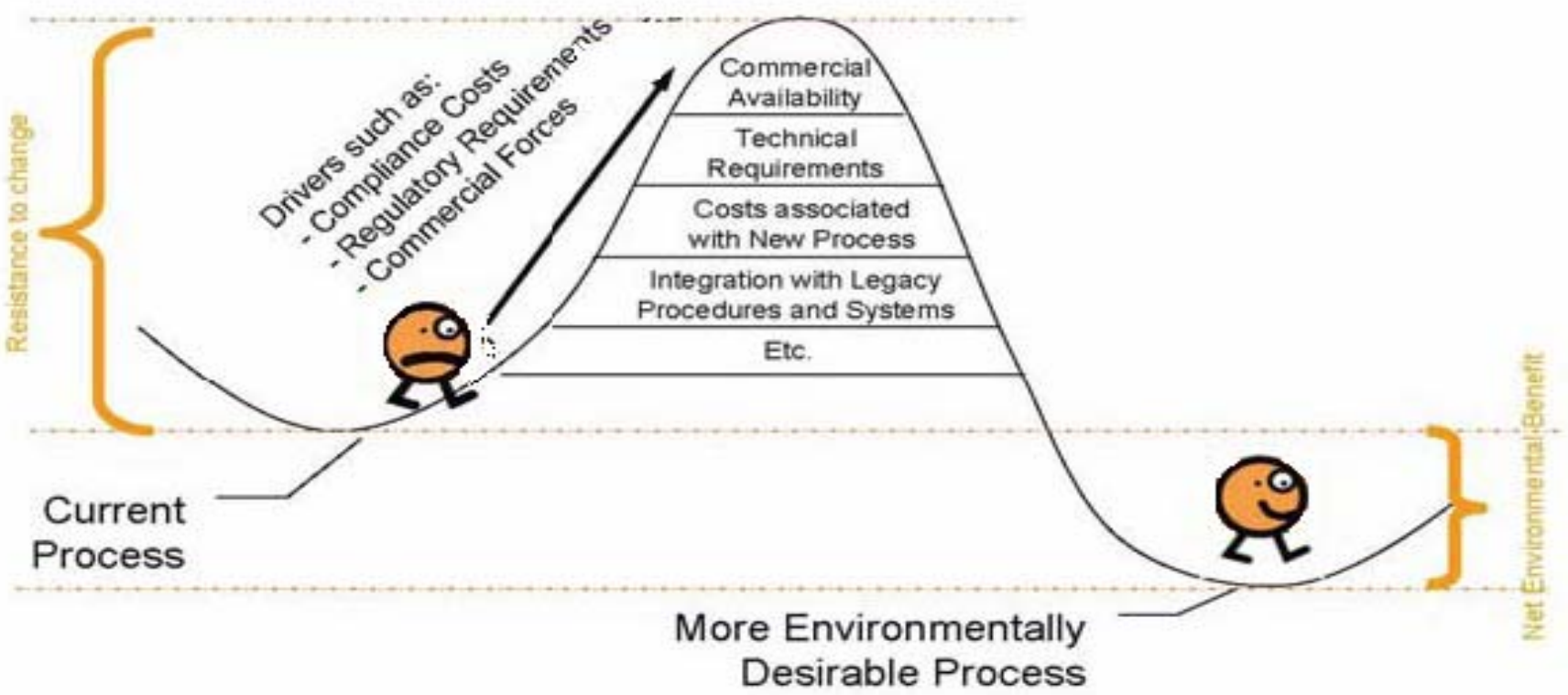
Implementing Change

- **Change requires some combination of:**
  - ✓ **Increased drivers**
  - ✓ **Decreased resistance**



‘90 Pollution Prevention Act Defines Source Reduction as:

Any practice which reduces the amount of any hazardous substance, pollutant, or contaminant entering any waste stream or otherwise released into the environment (including fugitive emissions)

prior to recycling, treatment, or disposal;

and reduces the hazards to public health and the environment associated with the release of such substances, pollutants, or contaminants.

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P2 = Source Reduction

- **P2 means "Source Reduction" & other practices 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

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P2 Means

- Process modifications;
- Feedstock substitutions;
- Product reformulation;
- Management practices or housekeeping alterations;
- Recycling within industrial processes; or
- Equipment replacement or modifications.

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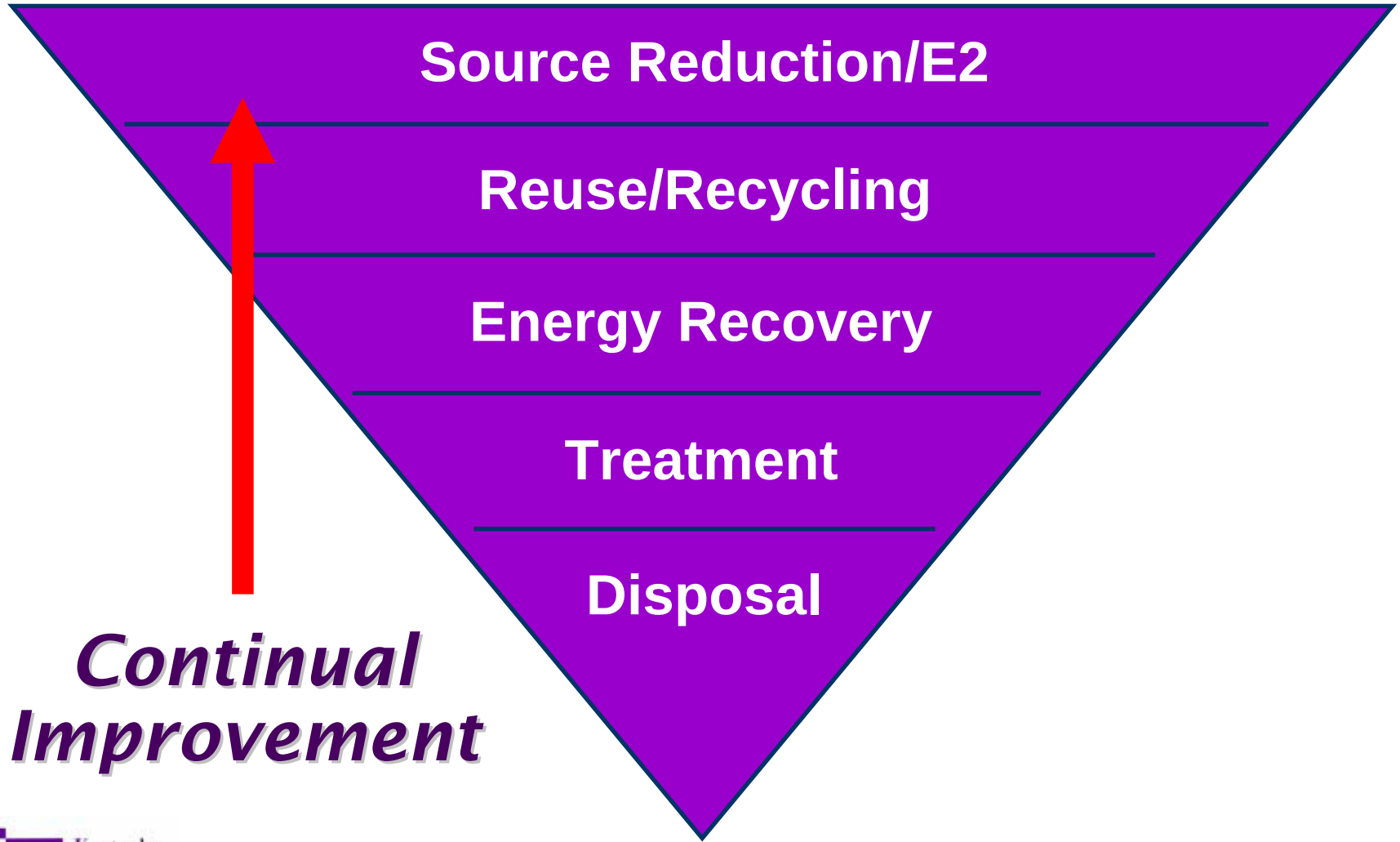
Move Up the Waste Management Hierarchy



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Multimedia P2 Focus

- **Water**
- **Air**
- **Solids**
- **Time**
- **Energy Efficiency (E2)**

(Estimated that Hospitals alone generate 2 M tons of SW per year)

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WHY will Health Organizations Develop a P2 Plan?

- **Comply w/ Joint Commission's "The Environment of Care" Standard**
  - ✓ **Documented management plan that considers HM & HW**
- **Comply w/ all regulations**
  - ✓ **P2, waste reduction & toxics use reduction focus**
- **Reduce impact on the environment**
- **Protect the safety & health of employees et al**
- **Improve the organization's image**

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Management of the Environment of Care Standards

- Design
- Teach
- Implement
- Measure & Evaluate
- Change

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WHAT will be Used to Accomplish the Objectives?

- Management Policy
- Teamwork/Training
- Assessments
- Written EM Plans
- Operational Controls
- Corrective Actions
- Performance Stds.
- Management Review & Annual Evaluation

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WHO is Involved and will be Responsible for P2 & EM Plan?

- Corporate Management
- Hospital Administrators
- EHS managers
- All employees!

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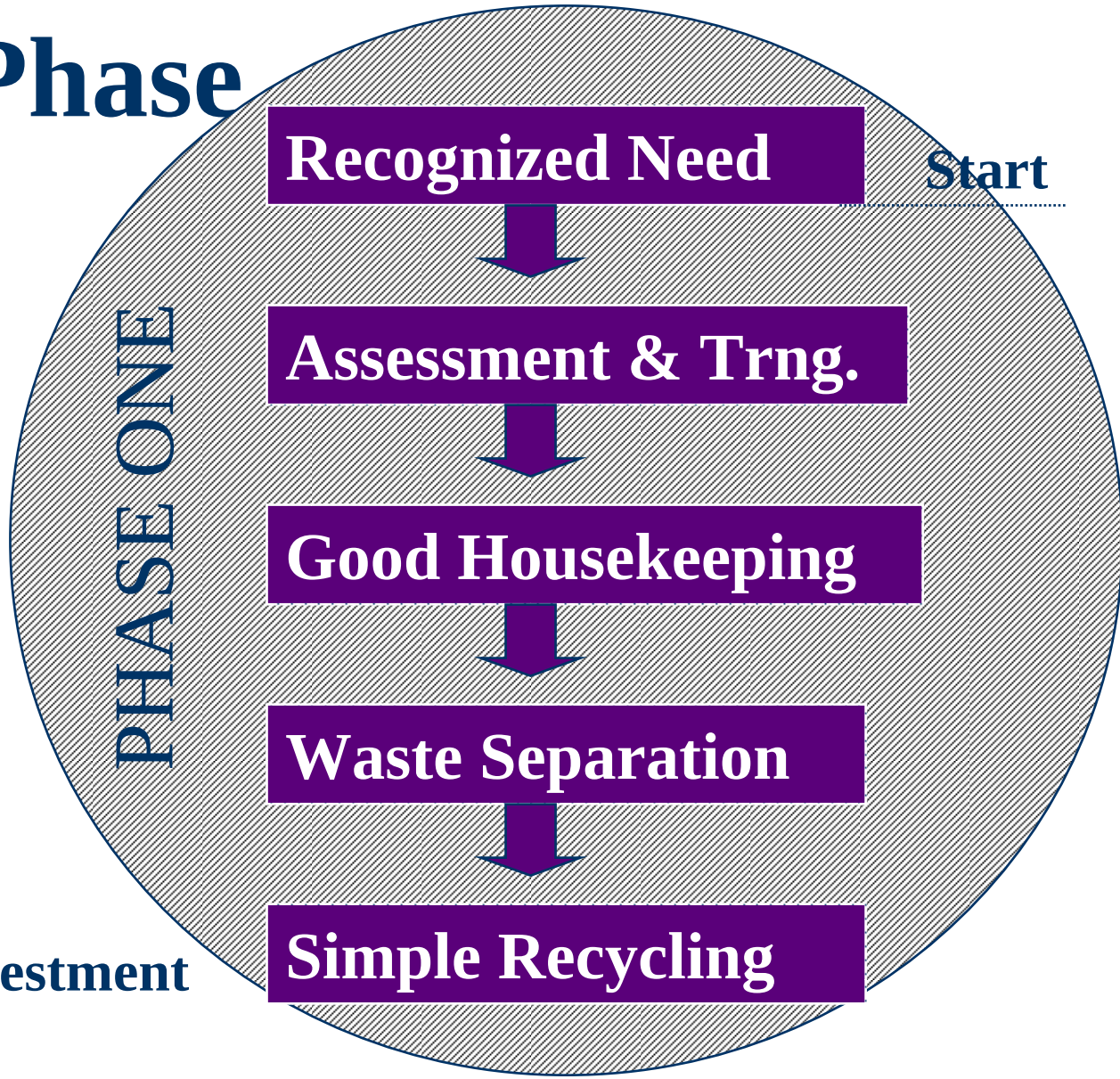
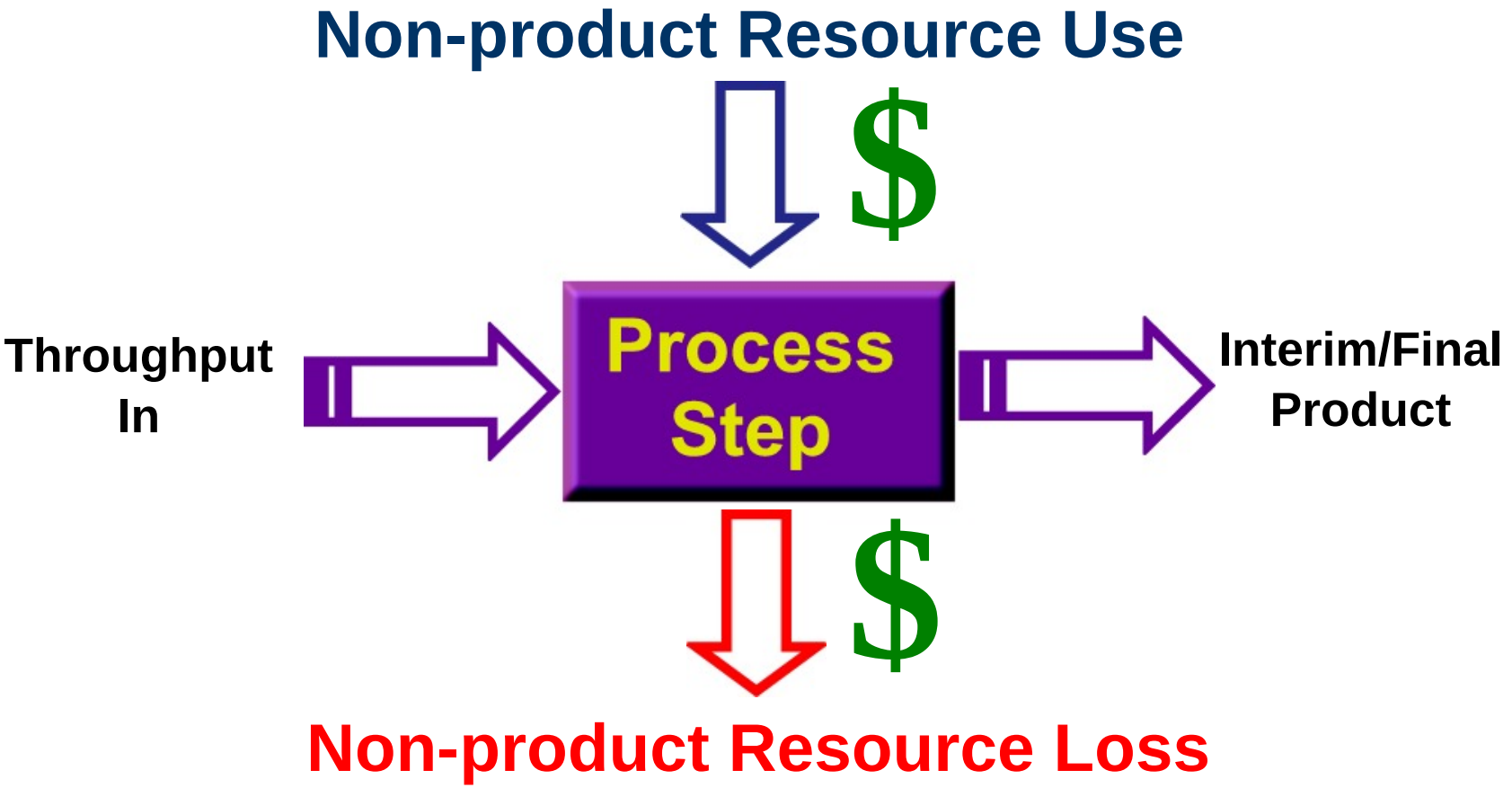
Waste Reduction Operation Phase



0-6 months
Big Return on Investment

Resource Accounting



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Plastics in Healthcare

- Light weighting containers
- Returnable & Reusable
- Recyclable

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Plastics in the Solid Waste Stream

- What types?
- $0.03/lb. or $60/Ton

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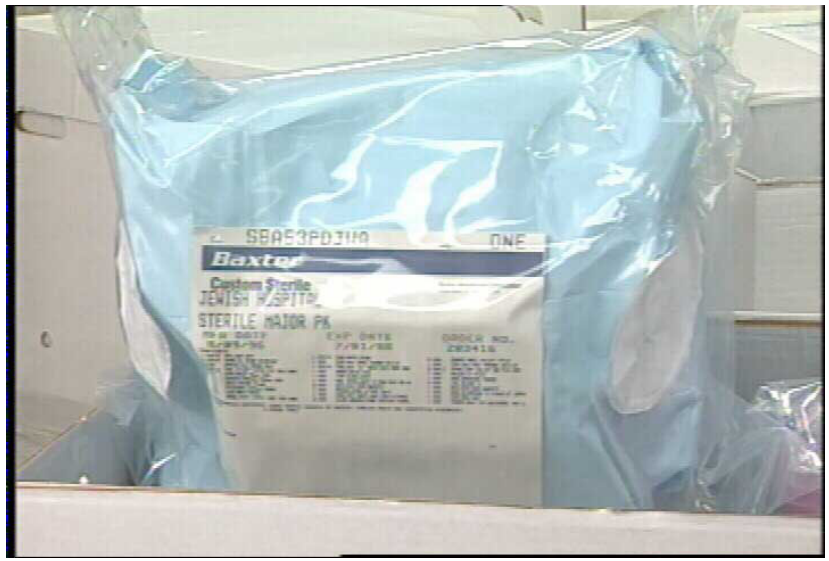
Solid Wastes in Red Bags



Red Bag "Biohazardous" Study (CMC's Women's Hospital Surgery)

- The weight of the red bag waste
- Actual contents of the red bag
- Approximate volume by percent of non-red bag
- Identify prohibited items in the red bag

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Red Bag "Biohazardous" Study

- **85 - 90% of waste was not biohazardous!!!**

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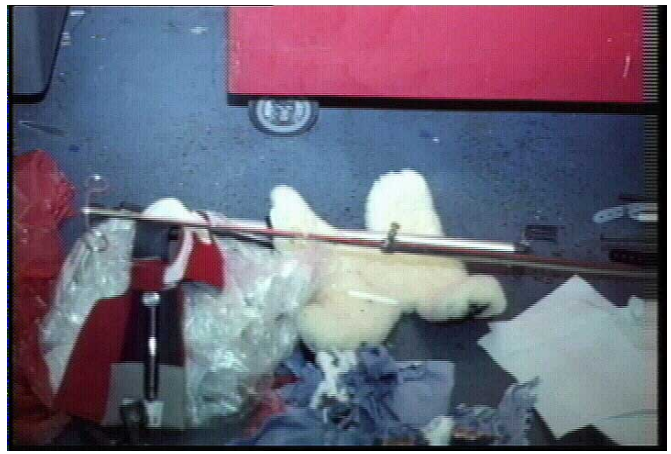
Generation Rate Factors: Red Bag "Biohazardous" Study



- Regulatory definitions for infectious wastes
- Regulatory interpretations/"Blood contaminated"
- Waste management policies & protocols
- Waste management practices & efficiencies
- Waste disposal restrictions & limitations

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Red Bag "Biohazardous" Study Results

- 2-week Survey of 2,382.6 pounds
- "True" red bag waste = 238 - 357 pounds
- If properly separated, savings =

$183,562/Yr

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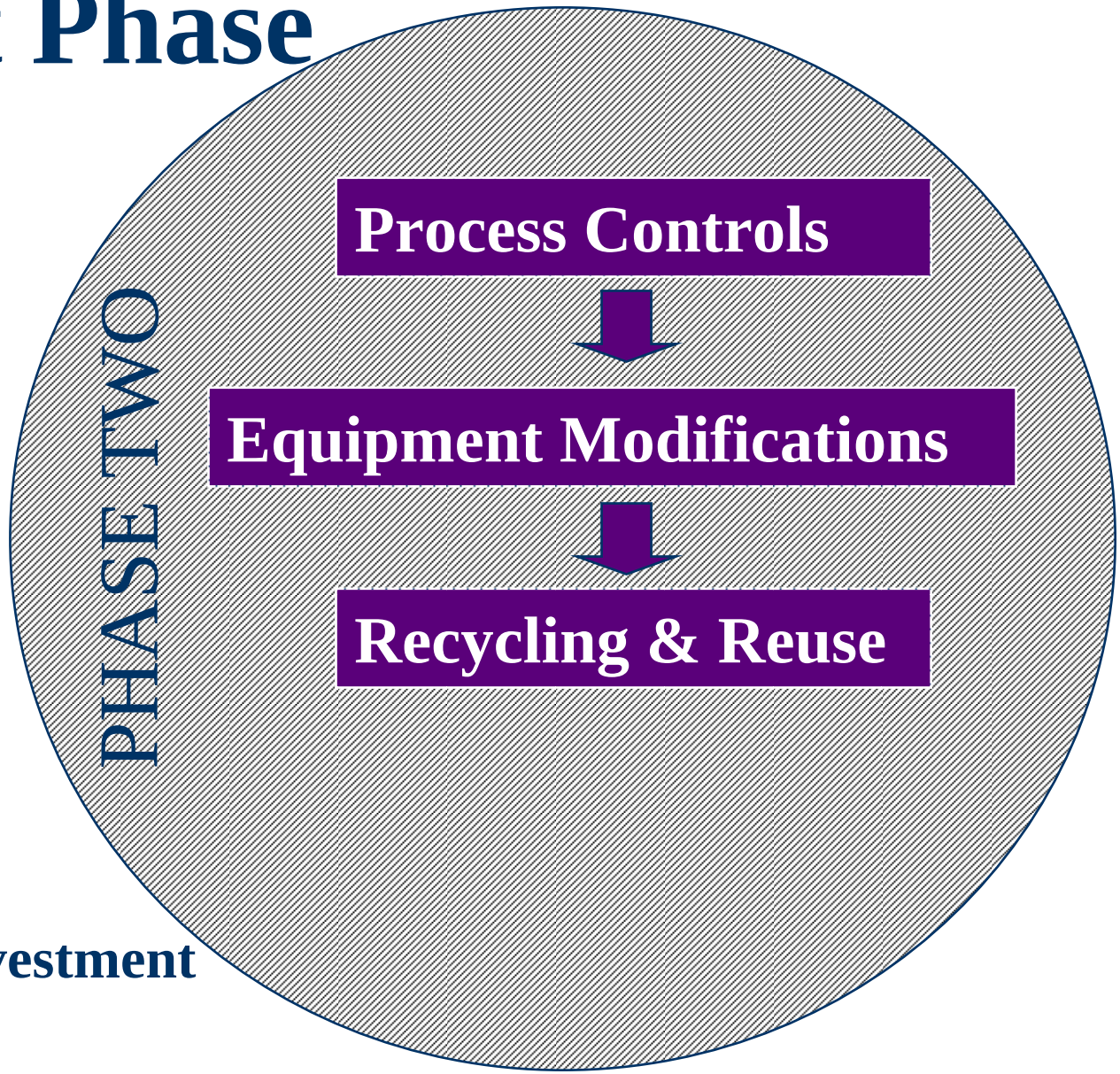
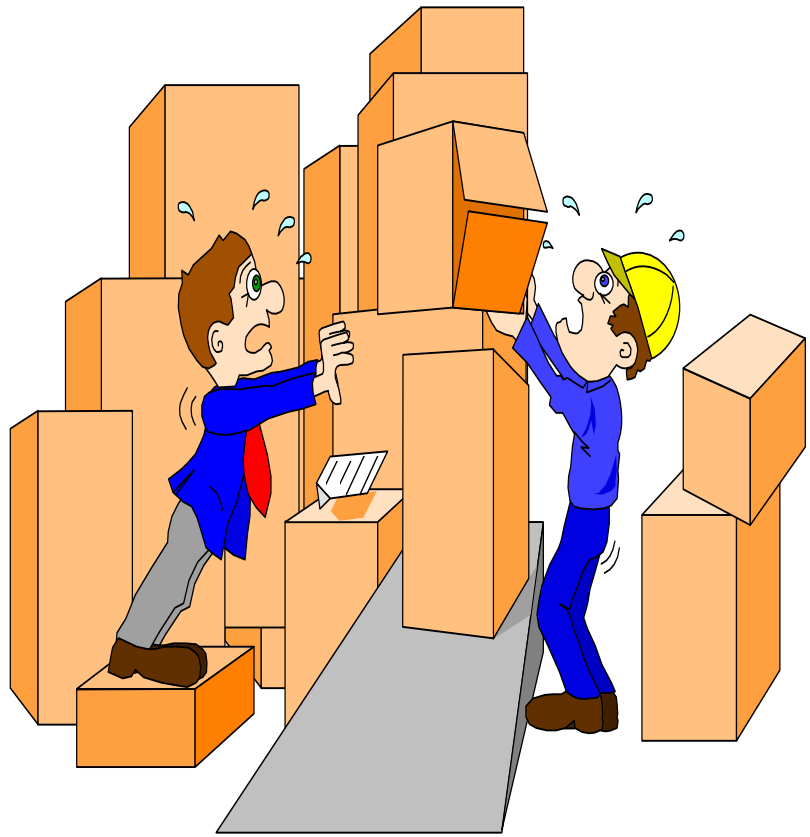
Waste Reduction Equipment Phase



6 months - 2 years
Some Return on Investment

Inventory Management

- **Procurement Control**
  - ✓ Material Types & Quantities
  - ✓ Container Sizes & Packaging Requirements
  - ➡ Raw Material Quality
  - ✓ MSDS's /Labeling
- **Material Control**
  - ➡ Unloading & Storage
  - ➡ Handling & Use
  - ➡ Reuse & Recycle



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Preferred Packaging Guidelines

- NO Packaging
- Consumable
- Minimal Packaging & Light weighting
- Returnable/Reusable
- Recyclable Packaging, Made from Recycled Materials
- Bulk Packaging

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Procedure Based Delivery System

- Just-In-Time Delivery
- Components needed for specific procedure
- Returnable & Reusable Packaging

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Silver & X-Ray Film Recovery

- **Electrolytic Silver Recovery Units**
  - ✓ **Batch, Re-Circulation & Flow-Through**

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Silver Recovery = $Revenue$

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WHAT Wastes will be Reduced?

- Solid Wastes
- Red Bag Waste
- RCRA Haz Waste
  - ✓ Xylene
  - ✓ mercury, silver
  - ✓ formaldehyde
  - ✓ pharmaceutical
- Waste Water
- Air Emissions

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Hazardous Wastes

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Epinephrine is hot topic nationwide right now (Is a P listed waste…EPA reviewing)

The Challenges

- **Little expertise within the healthcare community in handling hazardous waste**
- **Decentralized management of waste streams**
- **Healthcare is highly regulated**
  - ✓ **JCAHO *(Joint Commission Accreditation of Healthcare Organizations)***
  - ✓ **OSHA**
  - ✓ **EPA/KDEP/County**
  - ✓ **DOT**
  - ✓ **DEA**

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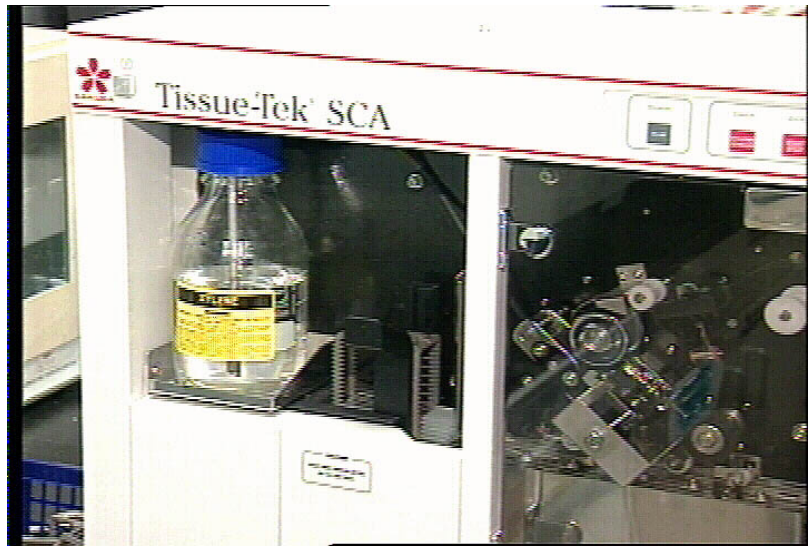
Mismanagement of Hazardous Waste

- Mercury bearing waste going down the drain
- Acute hazardous waste such as warfarin & epinephrine thrown in trash or red bag waste
- Lab wastes not evaluated
- Licensed as CESQG, may be SQG or LQG

Histology Lab Xylene



- **$18,000** Cost of Product
- **$11,616** Disposal Cost + Drums
- **$ 1,664** Labor
- **$ 550** State Fee
- **$ 2,600** Estimated Administrative Cost
- **$34,430** Annual Cost for Xylene Use

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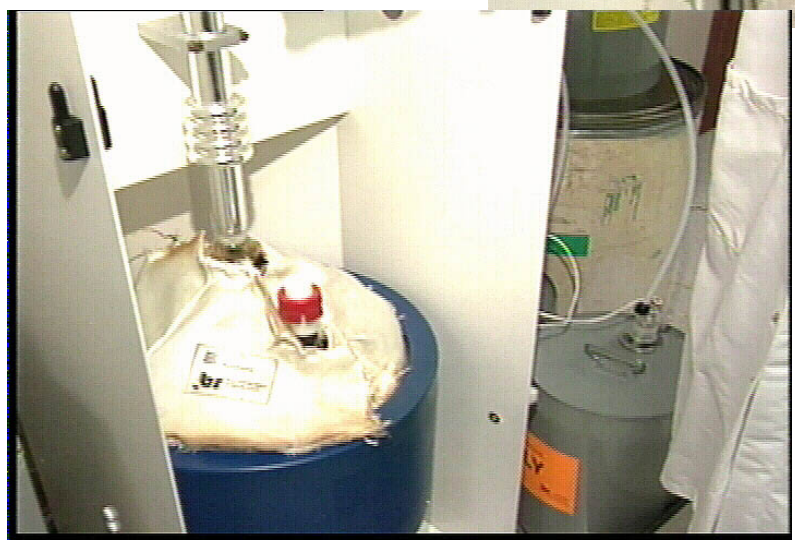
Xylene Recycle/Reuse Costs

- $18,500 Distiller
- $ 2,428 Replace Xylene
- $ 4,160 Labor
- $ 975 Disposal
- $26,063 Total Yr 1

ROI is 201 days



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Xylene Cost Savings

$26,867/Year

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Positive Recycling Outcomes

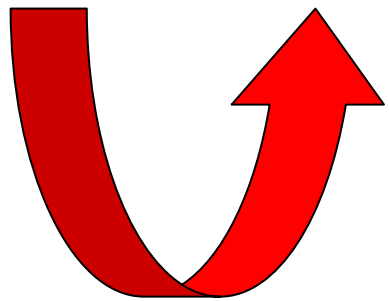
ABBOTT NORTHWESTERN SITE ONLY (in Minnesota)

Amount Recycled	Product	$/Gal	$Purchase	$ Dispo/Gal	$Disposal	Cost Savings
679 Gallons	Alcohol	7.04	4,780	2.80	$ 1,901	$ 6,681
610 Gallons	Xylene	12.00	7,320	2.80	1,708	9,028
1519 Gallons	Formalin	11.34	17,225	2.80	4,253	21,478

$37,187

Waste Disposal fees$ 3,679

Annual Savings $ 33,508



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Recycling Success

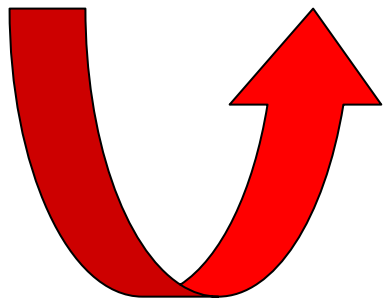
(Information provided by Lynn Montgomery, Allina Labs)

- **Allina Metro Hospitals**
  - ✓ Recycled 5057 gallons of reagents (92 drums)
    - Alcohol
    - Xylene
    - 10% formalin

- **Reduction in Reagent**
  - ✓ Purchases
  - ✓ Disposal fees
  - ✓ Freight and handling
  - ✓ Employee safety

Annual Savings at four metro hospitals

$ 62,988



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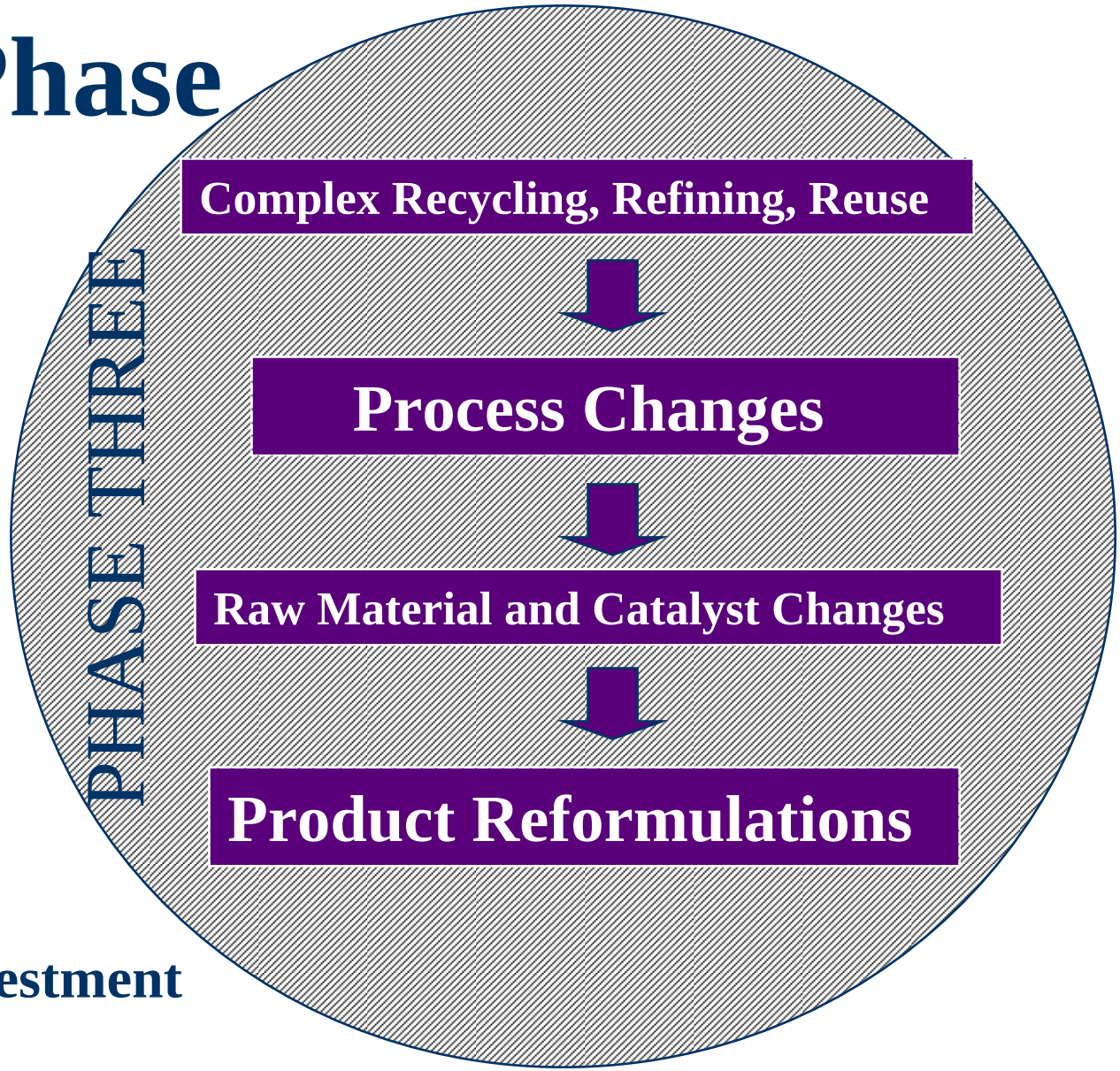
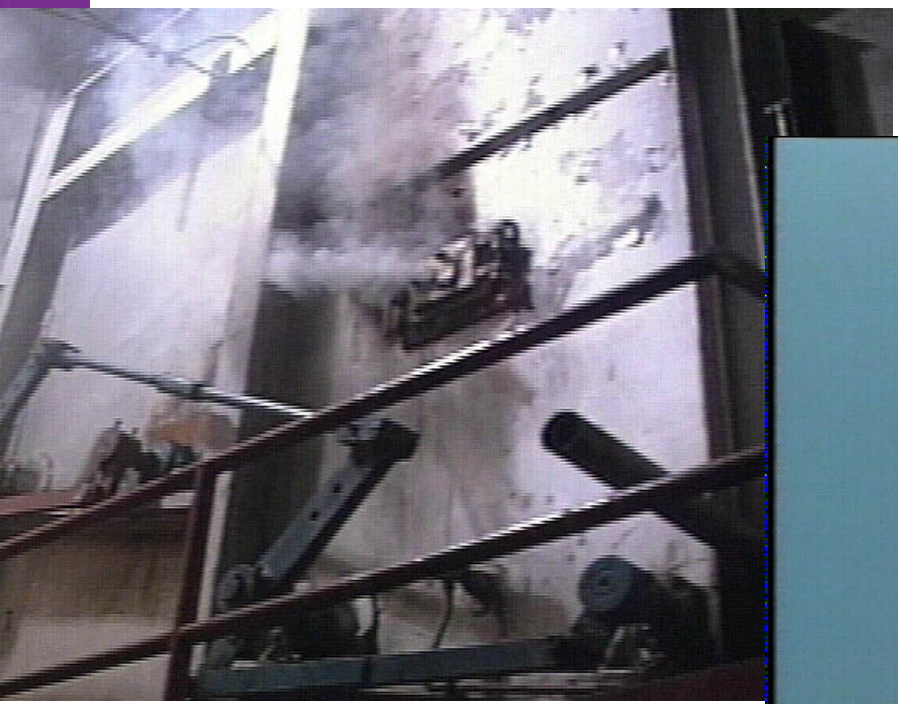
Waste Reduction Process Phase

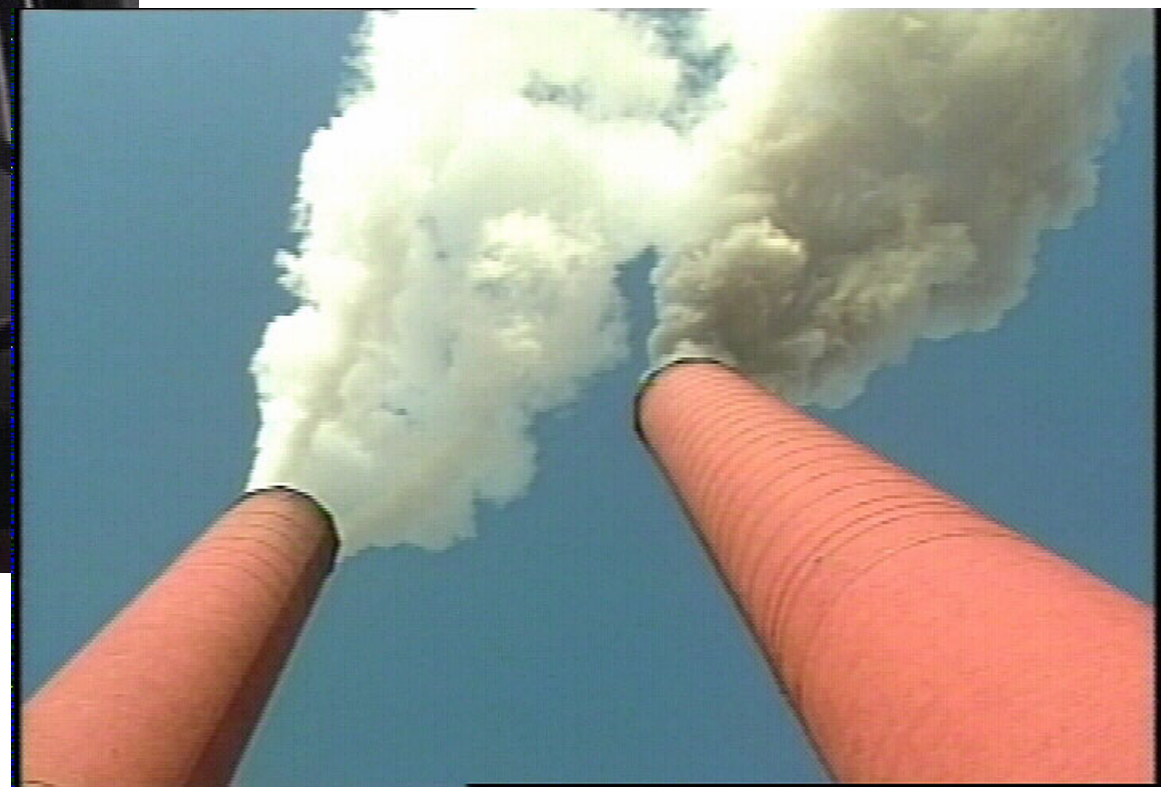


2 years - 5 years

Little Return on Investment

Mercury = Priority Pollutant





- PBT
- CAAA for MedWaste Incinerators

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Where's the Mercury?

Water-Soluble Products: Alternative to Red Bag Incineration

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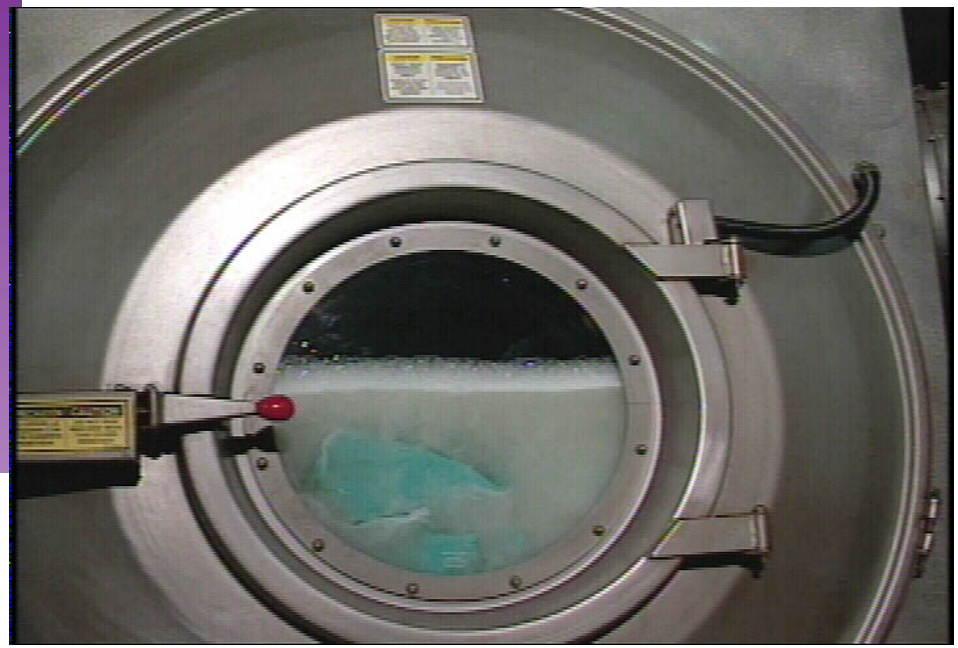
Water-Soluble Products: Industrial Washing Machine



- 205 Degrees F for 45 minutes

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Make Commitment to Continual Improvement

- **Energy Management (EM) is a process of continual improvement**
- **Organizations see financial returns from committed Energy Management Programs**
- **EMPs strive to improve energy performance**
- **Success based on:**
  - ✓ **Commitment**
  - ✓ **Regularly assessing energy performance**
  - ✓ **Implementing steps to increase Energy Efficiency (E2)**

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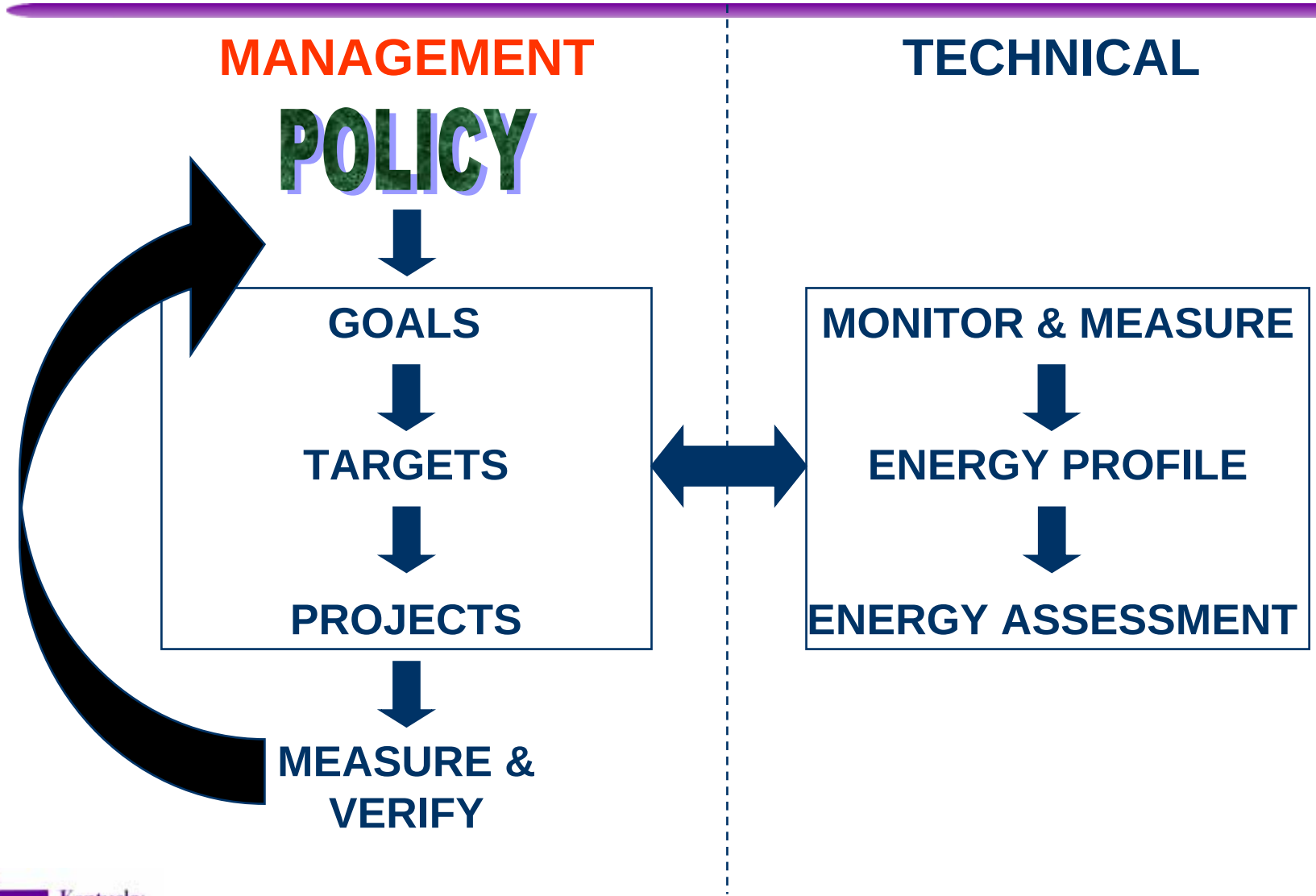
Don't Just Pay the Bill!

Energy Management Program



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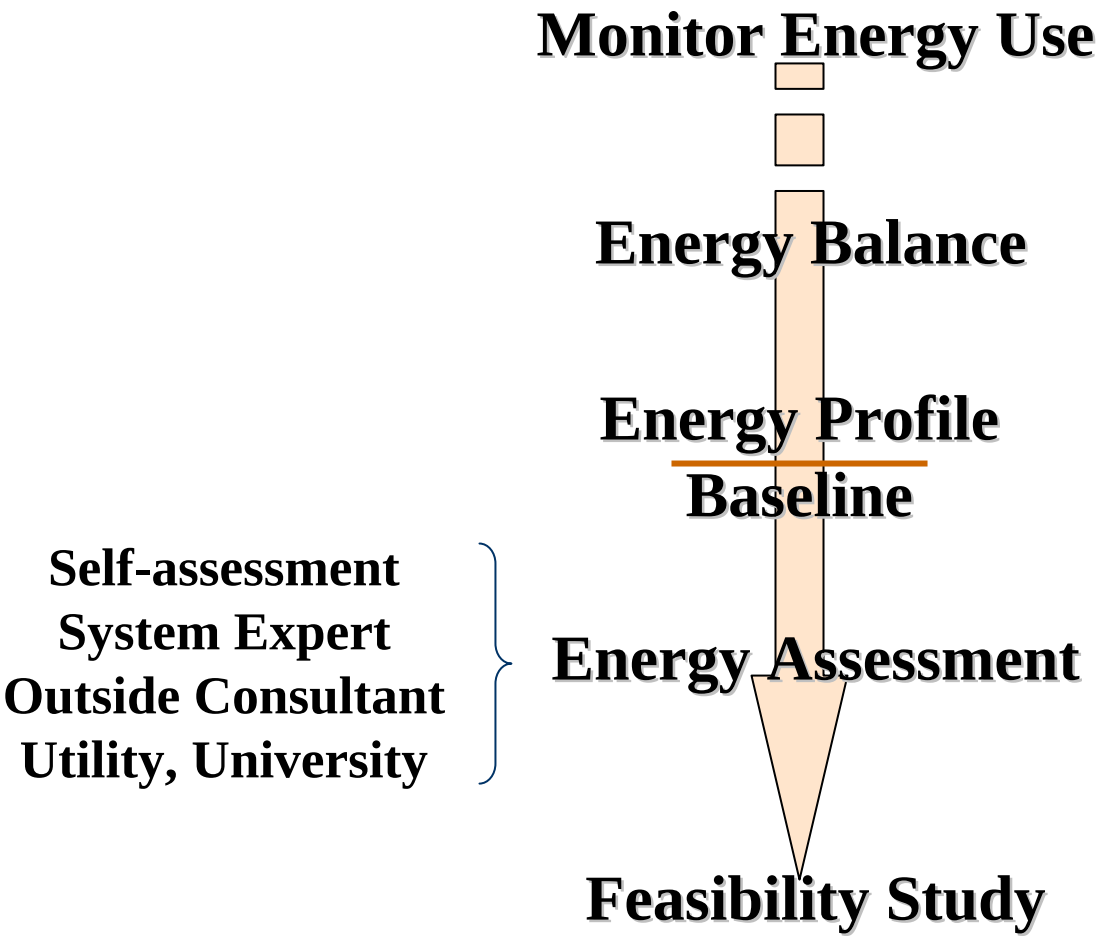
How do I find Energy Management Opportunities?



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Energy Bill Analysis: "The Low Hanging Fruit"

- **Essential component of any energy management program**
  - ✓ **Continuing account of energy use & cost**
  - ✓ **Keeping up-to-date records of monthly energy consumption & associated costs**
  - ✓ **A separate record will be required for each type of energy used, i.e., gas, electric, oil, etc.**
  - ✓ **Utility data can be electronically monitored by internet-based tools**

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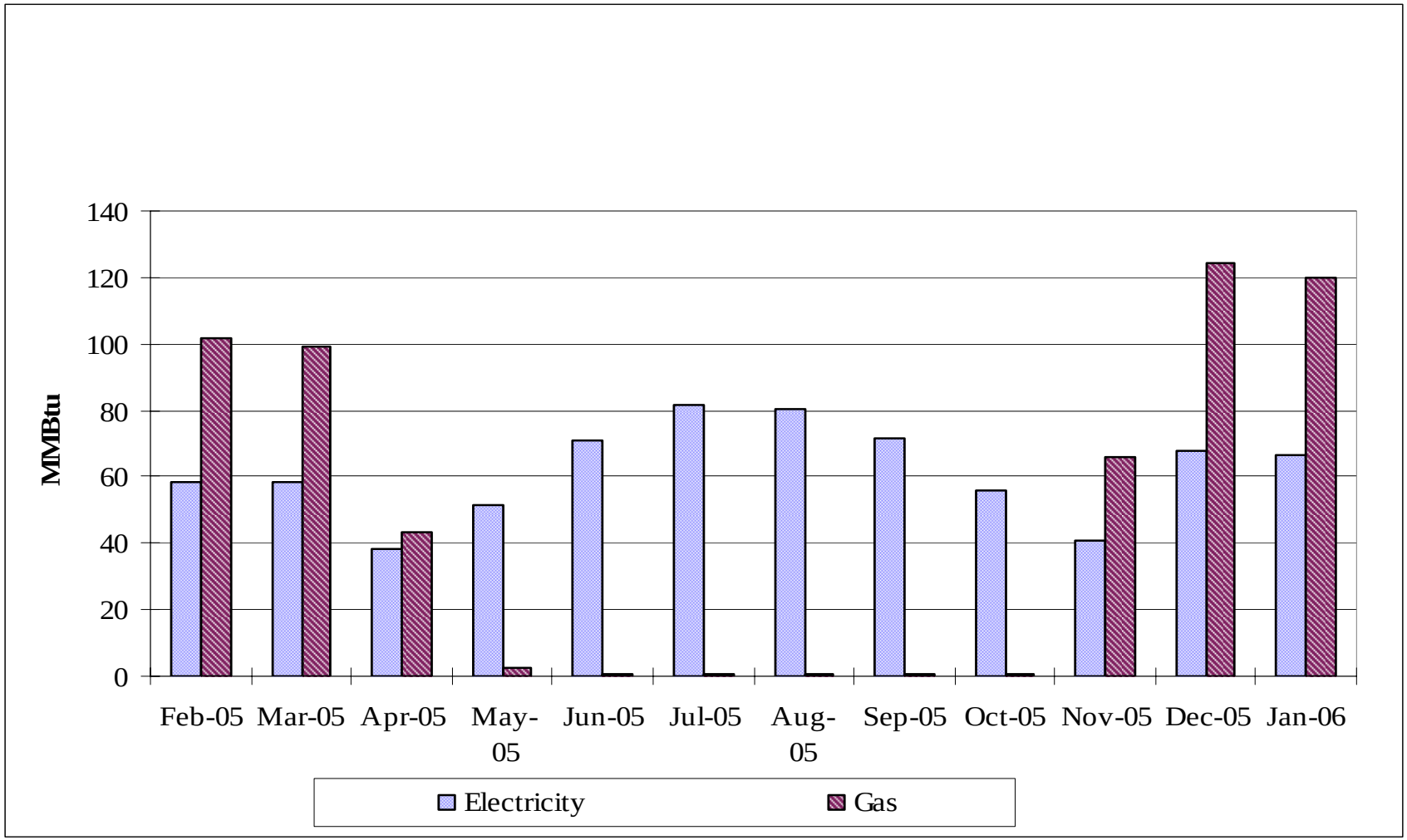
Tracking Energy Use



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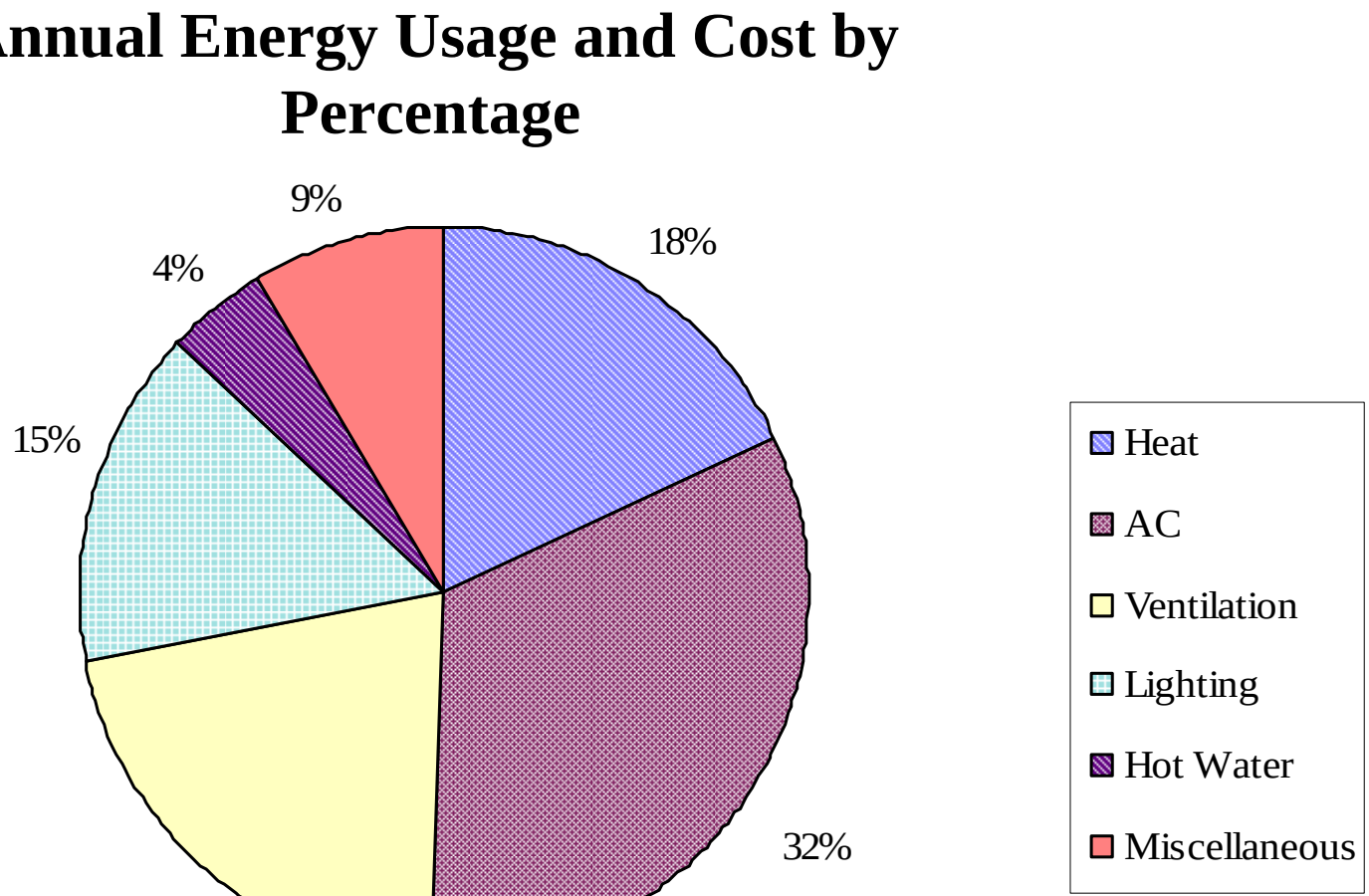
Energy Management Opportunities



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 efficient improvement strategies**

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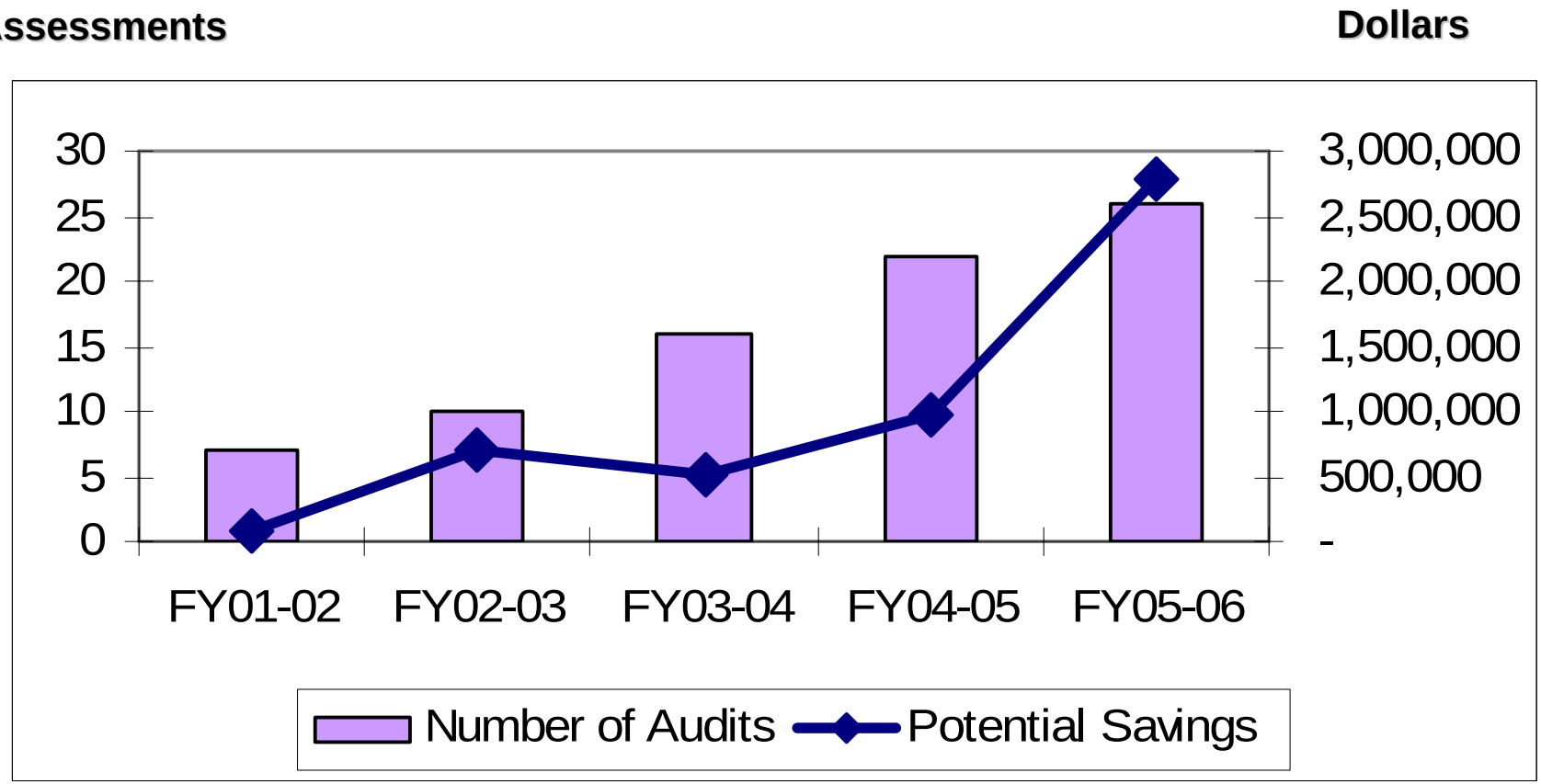
KPPC Energy Assessments & Cost Savings



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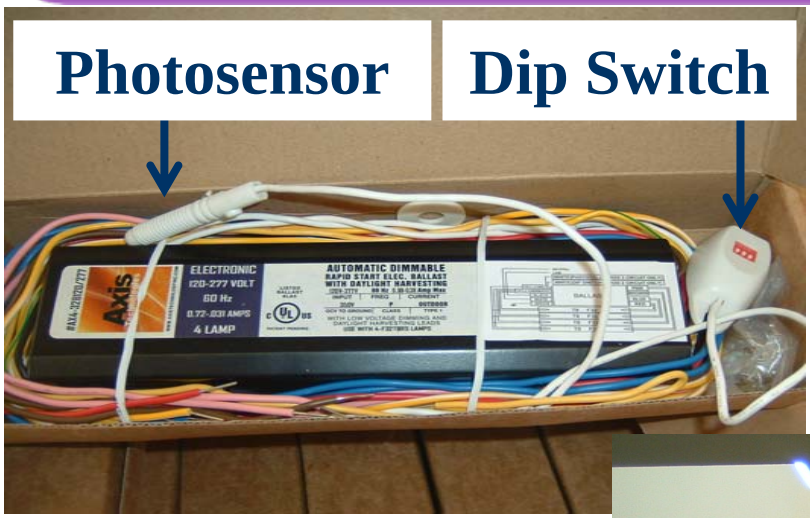
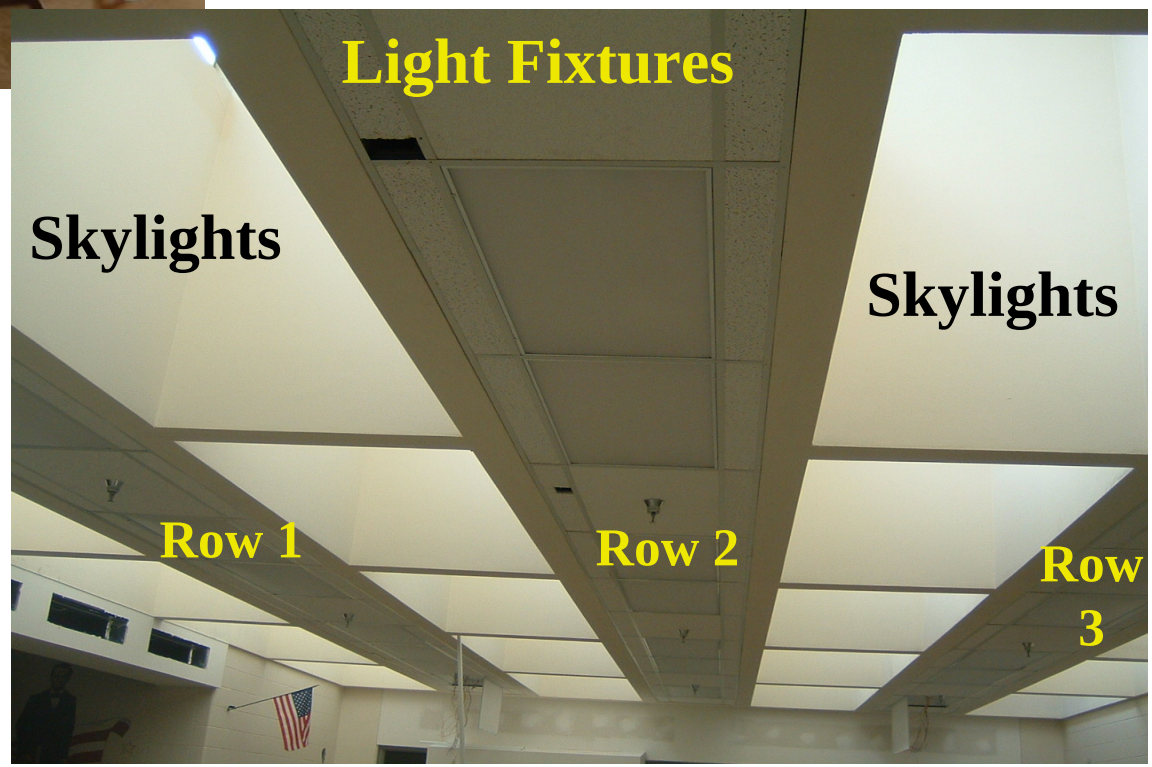
Daylight Harvesting Ballasts





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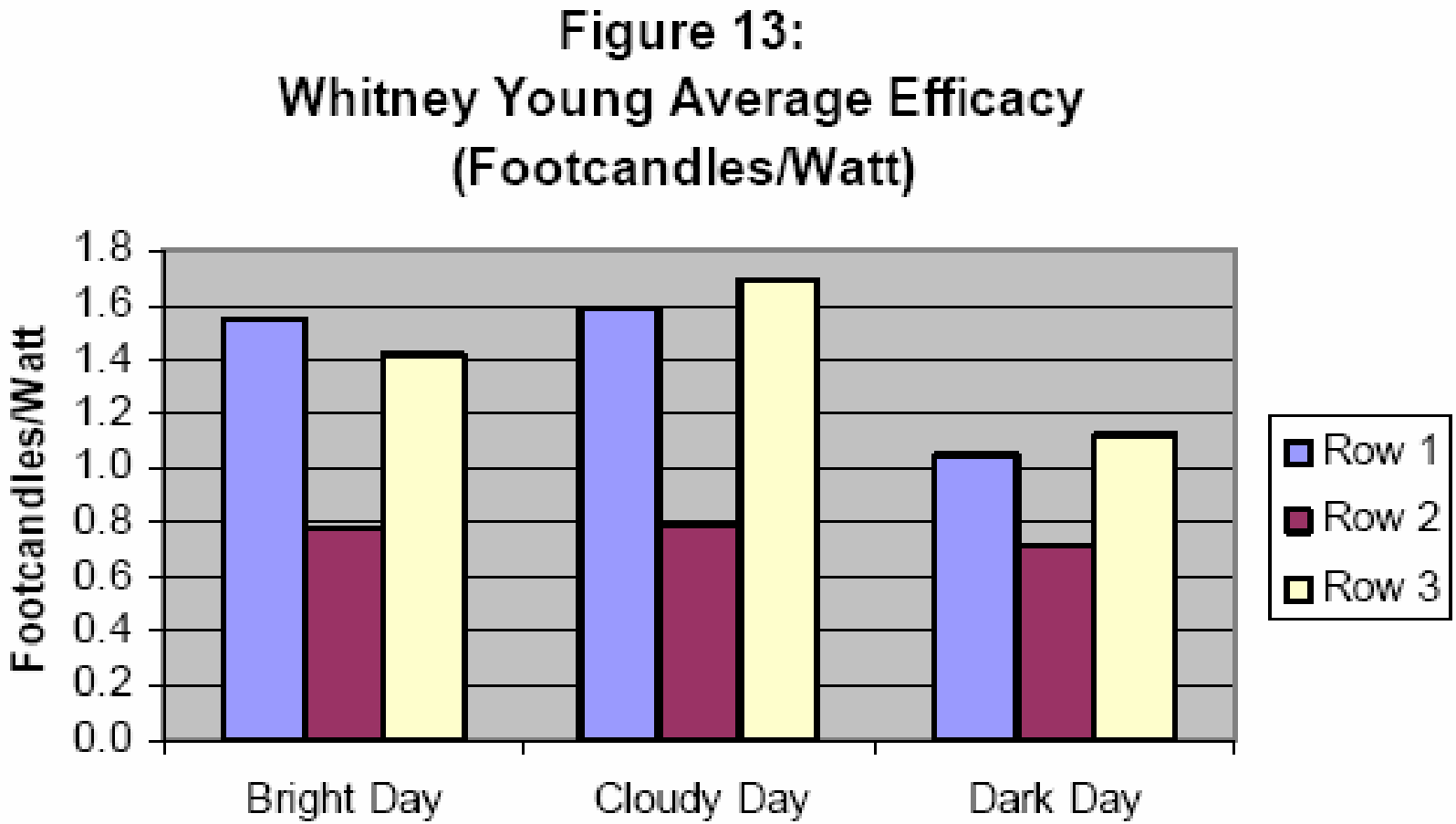
Daylight Harvesting Ballasts



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Daylight Harvesting Ballasts

Results

	Energy Savings (kWh/yr)	Energy Cost Savings ($/yr)	% Energy Savings
Coleridge Taylor-Library	1,074	$69	52.4%
Coleridge Taylor – Stairwell	3,041 (24 hrs.)	$194	48.5%
Whitney Young – Library	1,782	$43	55.2%

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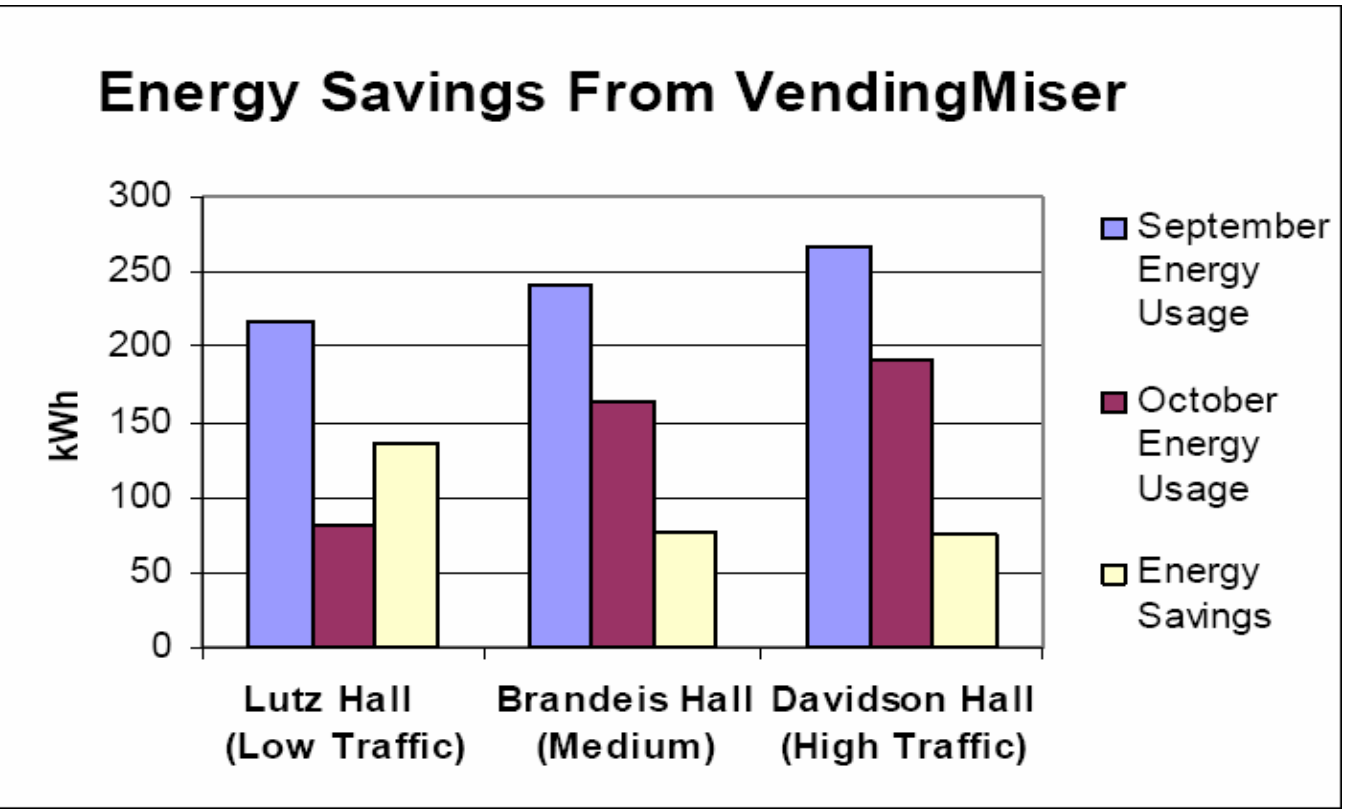
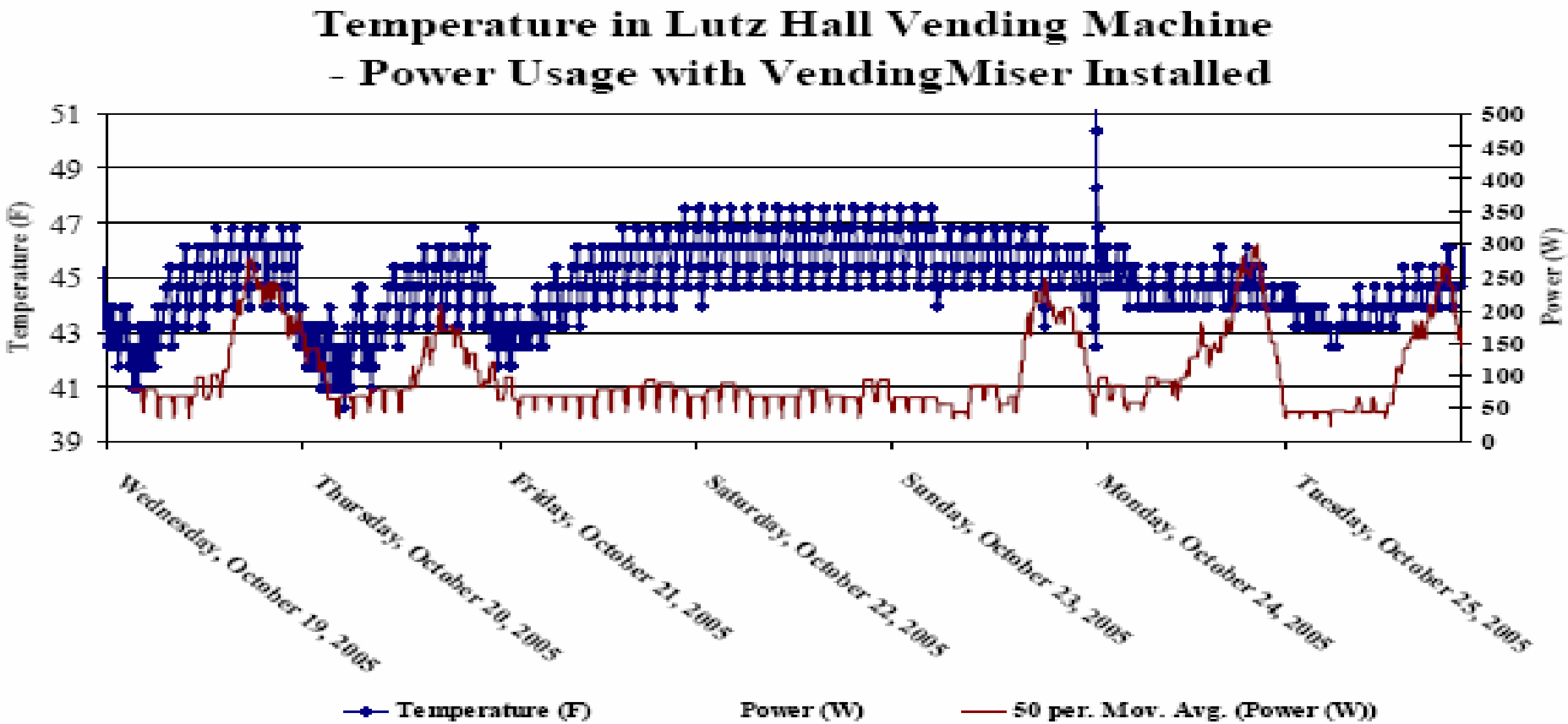
VendingMiser Testing

Energy Savings → 30% to 60%



A typical refrigerated vending machine can use over 2.600 kWh/yr
At $0.08/kWh = $210/yr

VendingMiser Testing



Temperatures inside the machine ran between 41 and 43˚F without the Vending Miser. The red line indicates that power usage was significantly reduced when traffic was low, nights and weekends.


HOLAN

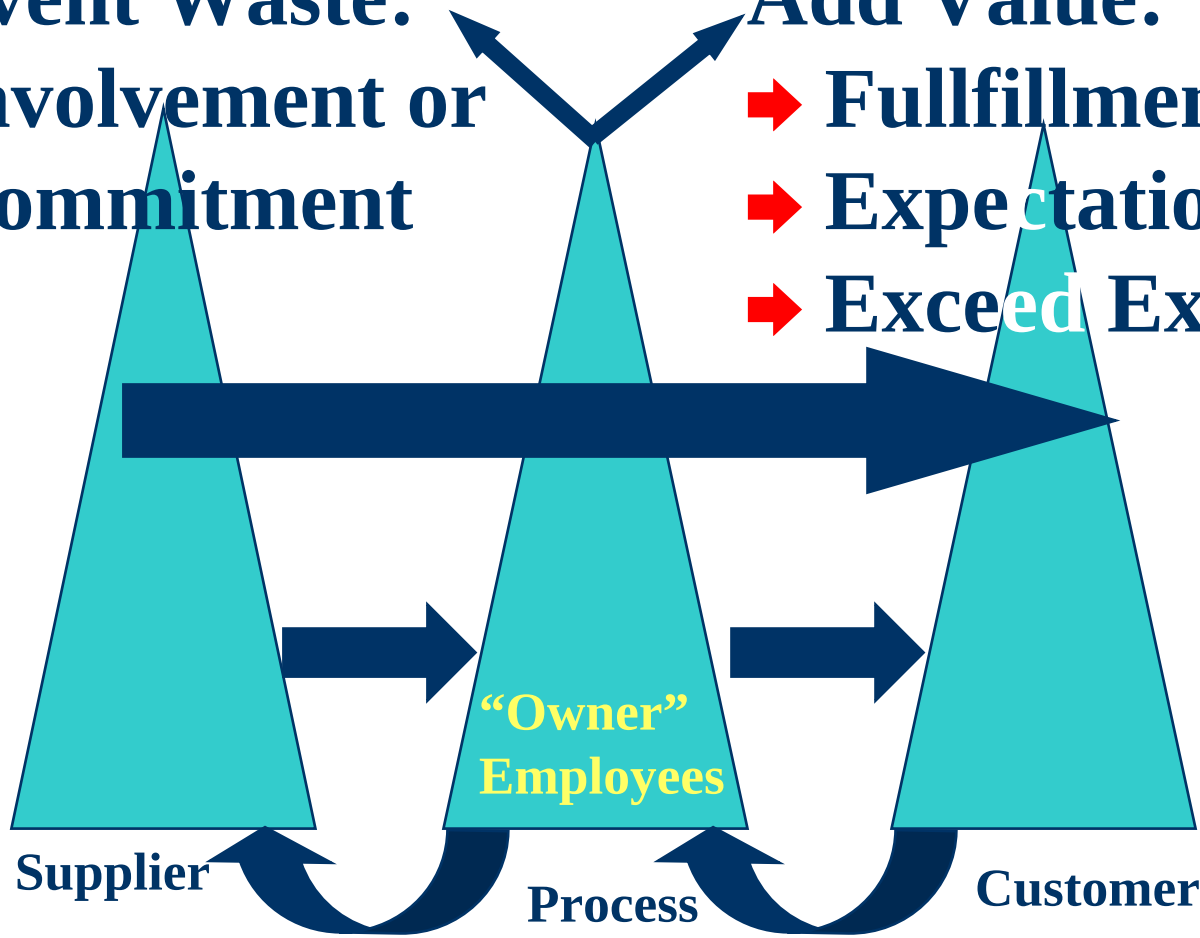
P2 & EMSs
"Systems Approach"

Prevent Waste:

- **Involvement or**
- **Commitment**

Add Value:

- **Fullfillment**
- **Expectations**
- **Exceed Expectations**



Can / should P2 become a strategic thrust for healthcare facilities?

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Benefits of an Environmental Management System

- Organizational improvements & efficiencies
- Diverse range of financial savings & payback periods for investments
- Improved communications, skills, knowledge & attitudes

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Benefits of an Environmental Management System

- **Improved:**
  - ✓ **Environmental performance**
  - ✓ **Legal compliance assurance**
  - ✓ **Energy & material efficiencies**
- **New business & customer "delight"**
- **Enhanced image**

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ESMS SUSTAINABILITY

Environmental Excellence!

Is everyone working from the latest *PLAN* on "how we do things"?

SAY WHAT YOU DO,
DO WHAT YOU SAY!

IF IT MOVES, TRAIN IT!
IF IT DON'T MOVE, CALIBRATE IT!

BUT NO MATTER WHAT YOU DO,
DOCUMENT IT!!!

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EMS Implementation

- **EMS written plan**
  - ✓ Plan Schedule
- **Structure & Responsibilities**
  - ✓ Top management
  - ✓ EMS Implementation Team
  - ✓ All of organization's employees
- **Process to develop & implement the EMS**
  - ✓ Consider EMS components
  - ✓ EMS Gap Audit
  - ✓ Determine how to involve employees in process

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Adopt a Team Approach for EMS

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

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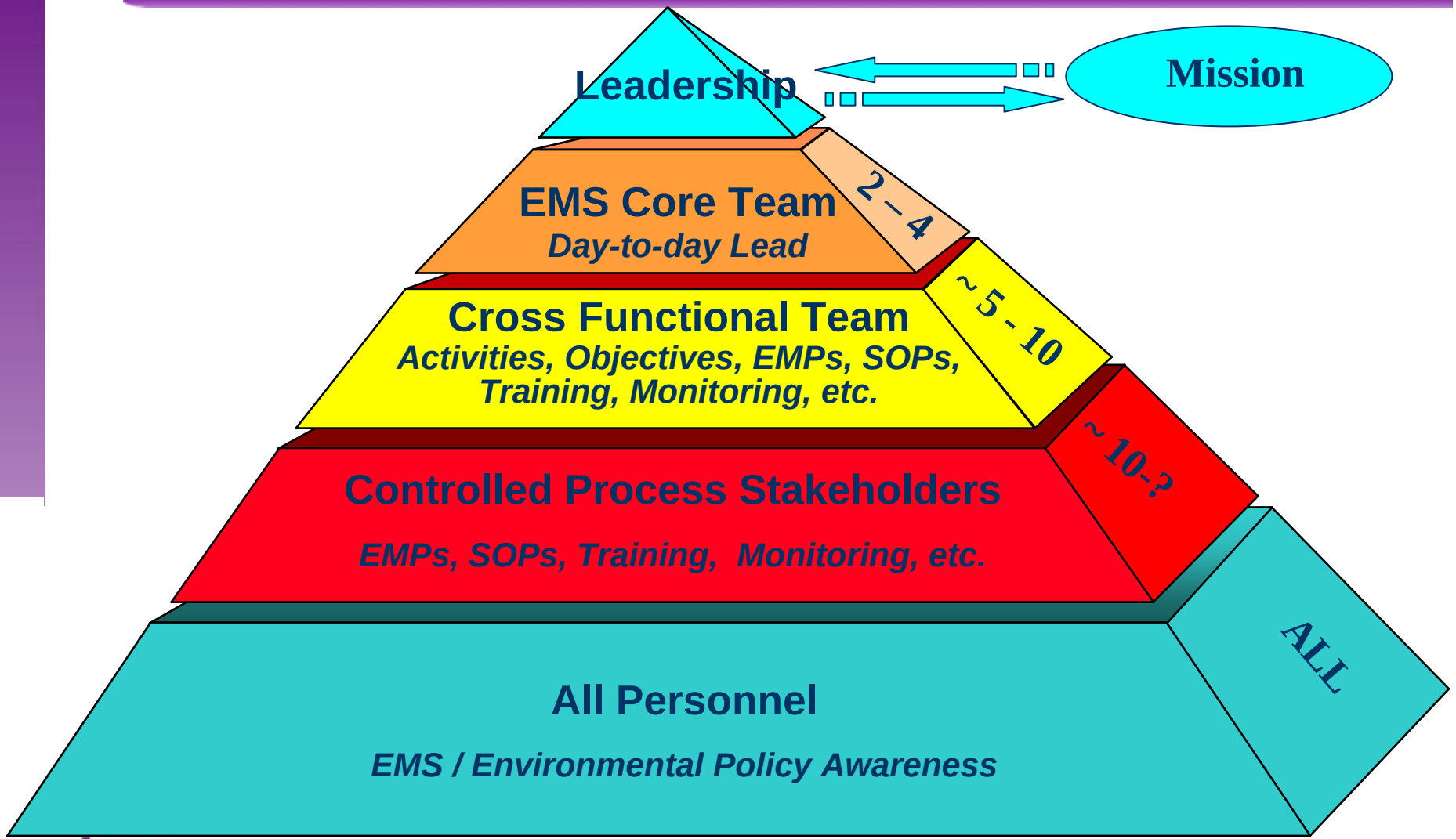
EMS Players



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Performance Standards "The Environment of Care"

- Staff knowledge & skills
- Level of staff participation
- Monitoring & measuring activities
- Emergency & incident reporting procedures
- Inspection & testing of equipment
- Opportunities for continual improvement

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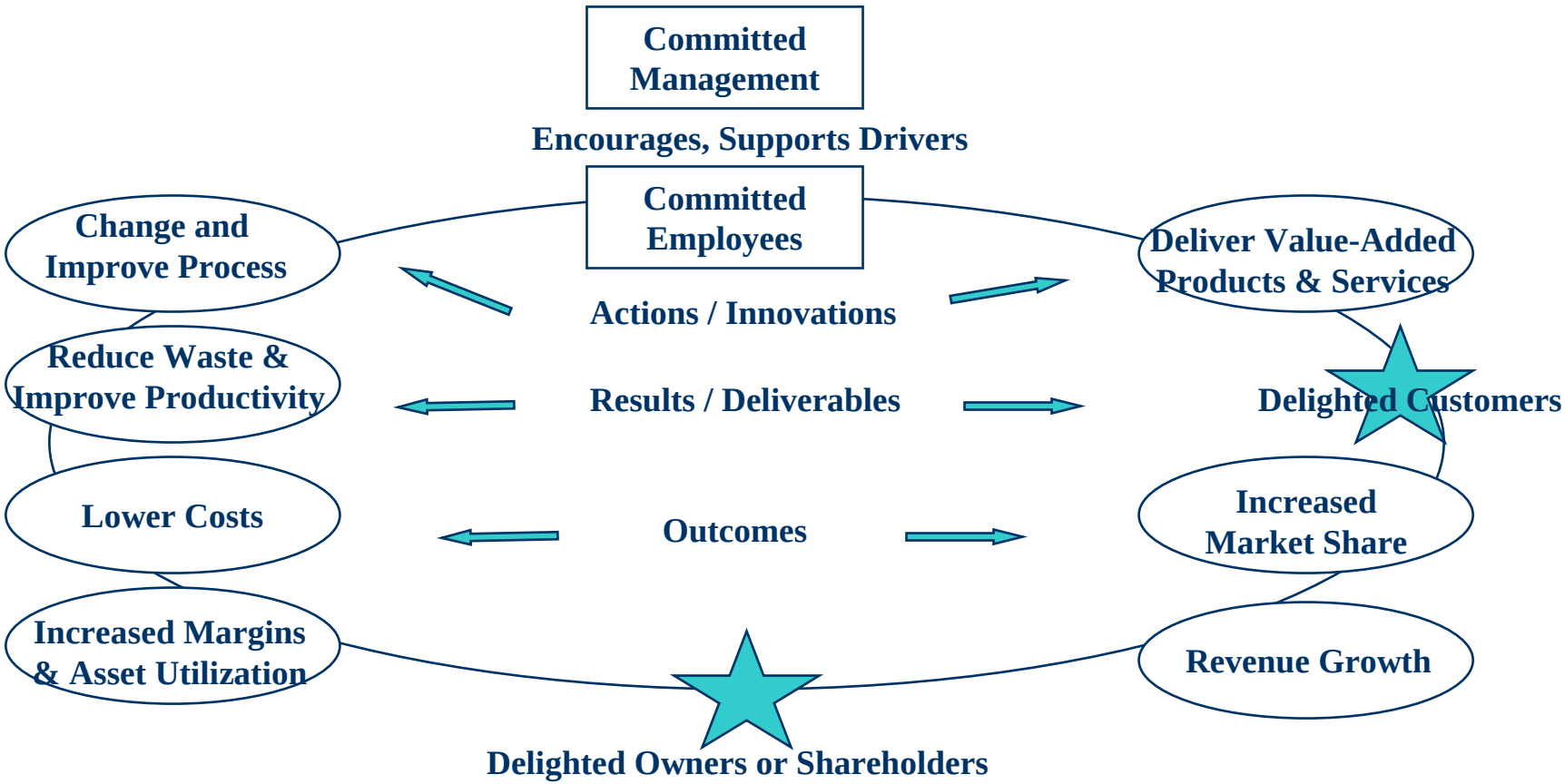
How Environmental Management Supports a Business



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Strategies

- Many approaches: regulation, certification, cost savings, recognition
- Meet & interact with regulated community
  - ✓ Hospital waste streams are complex
  - ✓ Might need compliance assistance
- Increase awareness of P2, E2 & EMSs
- Closer look at wastes for P2 opportunities
- Energy usage tracked to target E2 opportunities
- Strive for continual improvement

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Partnerships

- Connections to regulatory staff (DCA & KY EXCEL)
- Hospitals for a Healthy Environment (H2E)
- KY Hospital Association (KHA)
- KY Pollution Prevention Center (KPPC)
- Others

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KPPC Contact Info

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Web Site: www.kppc.org

Healthcare Organizations' Case Studies:
www.kppc.org/library/audiovideo/healthcare.cfm

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Plan Do Check Act EMS