Pollution Prevention (P2) and Compliance Assistance at IDEM

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Office of Program Support
Pollution Prevention and Compliance Assistance Section

P2 and Compliance Assistance Overview

- Introduction to IDEM
- Office of Program Support P2 Programs
- CTAP
- The Pollution Prevention Act
- Pollution Prevention Defined
- Why Do P2?
- P2 Strategies
- Combining P2 and Compliance Assistance
- P2 Resources

Introduction to IDEM

- In 1985, the Indiana General Assembly created the Indiana Department of Environmental Management (IDEM) under Title 13 of the Indiana Code. The agency began operating on April 1, 1986.

- The legislation set forth divisions for air pollution control, water pollution control, solid waste management, pollution prevention, and administrative services, as well as offices for communications with the public and dealing with environmental emergencies.

- IDEM ensures that regulated entities comply with federal and state environmental laws and rules that help protect Hoosiers and our environment.

IDEM's Mission

IDEM's mission is to implement federal and state regulations to **protect human health and the environment** while allowing the environmentally sound operations of industrial, agricultural, commercial, and governmental activities vital to a prosperous economy.
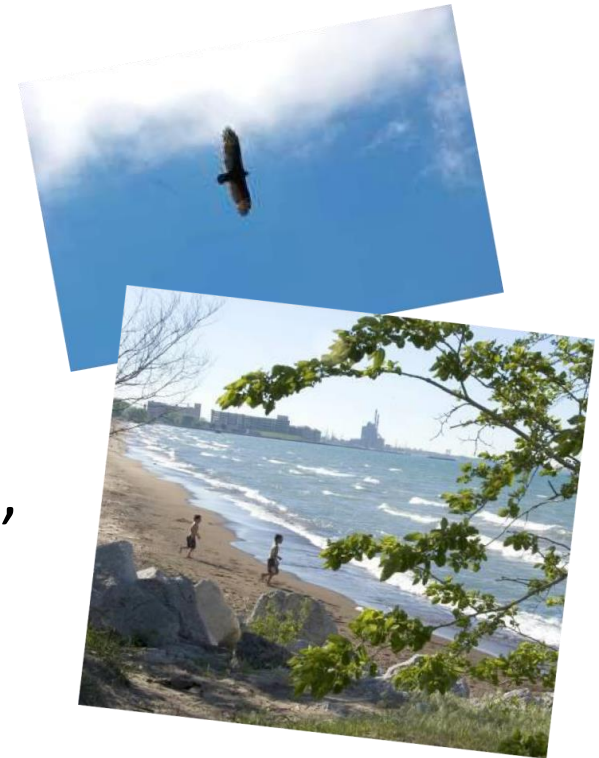
Agency Structure

Office of Air Quality

Office of Water Quality

Office of Land Quality

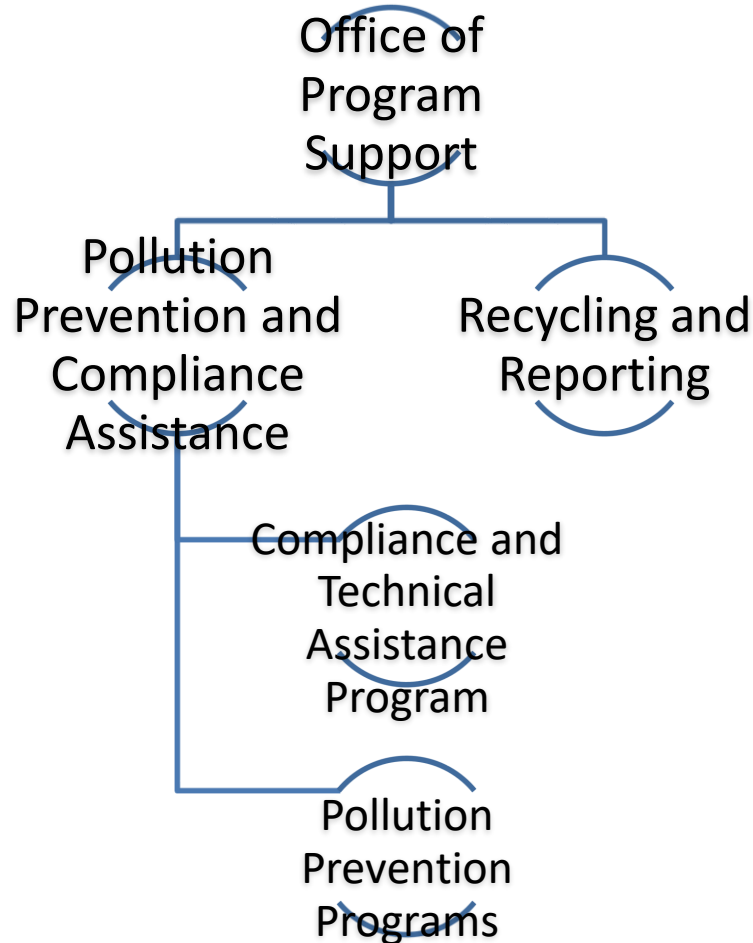Office of Program Support

Office of the Chief of Staff

Office of Legal Counsel

IDEM 101 Presentation

Office of Program Support

Office of Program Support

Pollution Prevention and Compliance Assistance

Recycling and Reporting

Compliance and Technical Assistance Program

Pollution Prevention Programs

Office of Program Support P2 Programs

- [Environmental Stewardship Program](#) – A voluntary program that recognizes and rewards regulated entities for going above and beyond current environmental regulations.

- [Indiana Partners for Pollution Prevention](#) – An organization comprised of Indiana industries, businesses, nonprofit organizations, and governmental entities that are interested in pollution prevention and its financial and environmental benefits.

- [Comprehensive Local Environmental Action Network (CLEAN) Community Challenge](#) – A voluntary program that recognizes and rewards communities that proactively manage environmental and health impacts associated with governmental operations.

Office of Program Support
P2 Programs

- Clean Vessel Act Grant Program and Boating Infrastructure Grant Program – Provide grants to marinas for projects that prevent nonpoint source pollution and add infrastructure.

- Indiana Clean Marina Program – Provides technical assistance to marinas and boaters and recognizes marinas for environmental stewardship.

- Governor's Awards for Environmental Excellence – Indiana's most prestigious environmental recognition awards for the most innovative, sustainable, and exemplary programs or projects that positively impact Indiana's environment.
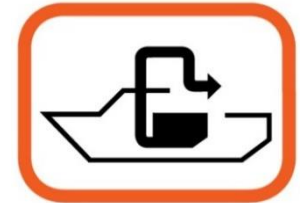
Compliance and Technical Assistance Program (CTAP)

The [Compliance and Technical Assistance Program (CTAP)](#) – Provides confidential compliance and technical assistance, training, and workshops to the regulated community to support environmental compliance.

Office of Program Support
Compliance and Technical Assistance Program (CTAP) Regional Staff

(1) Northwest Regional Office
(888) 209-8892

(2) Northern Regional Office
(800) 753-5519 x 4879

(3) Central Regional Office
(800) 988-7901

(4) Southwest Regional Office
(888) 672-8323

(5) Southeast Regional Office
(877) 271-0074
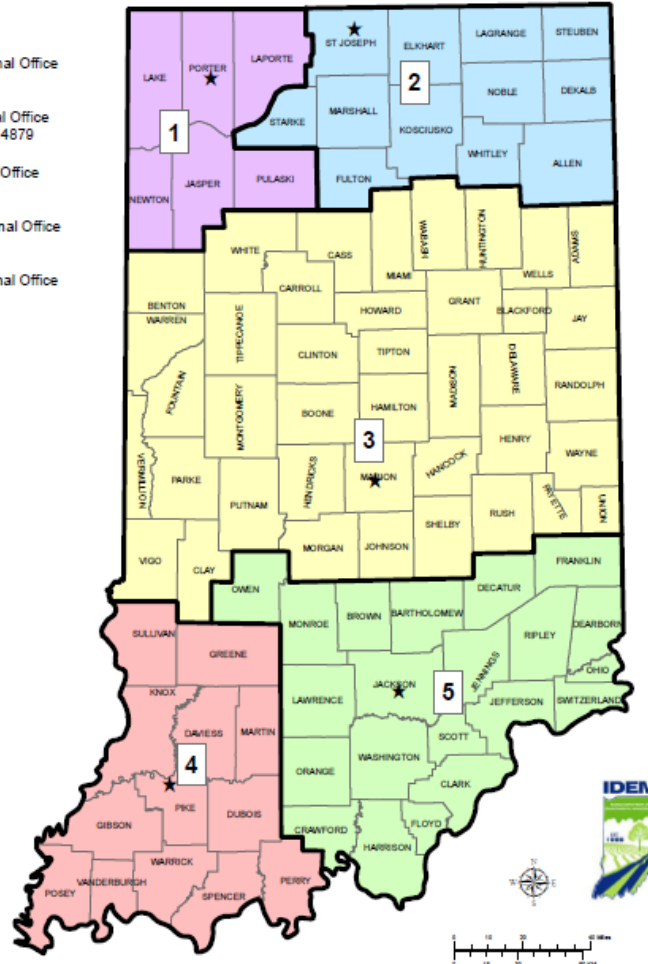
This map is intended to serve as an aid in graphic representation only.
This information is not warranted for accuracy or other purposes.

Mapped by: Sara Rotz, Office of Compliance Support
Last Revised: 5/5/2014

Sources: Office of Program Support's Compliance and Technical Assistance Program
Non Orthophotography Data - Obtained from the State of Indiana Geographical Information
Office (GIO) Library

Map Projection: UTM Zone 16 N Map Datum: NAD83

CTAP

The Compliance and Technical Assistance Program (CTAP) provides assistance to help Indiana businesses understand and comply with environmental regulations. It is important to note the following about CTAP assistance:

- **Nonregulatory –** CTAP staff members are not regulators and do not have regulatory authority. Therefore, businesses will not be penalized for reporting relevant environmental information to CTAP when requesting assistance.

- **Free and Confidential –** While CTAP staff members serve as liaisons between the regulatory programs and businesses, they do not provide any details about the company to regulators, as the information is protected under Indiana Code 13-28-3-4.

CTAP (cont.)

- **Assistance** – CTAP staff members provide assistance through on-site visits or via phone and will provide a full compliance review or just target a single issue. They also develop training programs, brochures, and webinars to help businesses understand the state and federal environmental regulations that affect them.

- **Multimedia** – CTAP staff members are knowledgeable in air, water, land, and Community Right-to-Know regulations and are happy to answer questions in these areas.

CTAP's staff assists businesses that contact them directly, are referred by regulatory inspectors or permit writers, or are impacted by a new U.S. Environmental Protection Agency or state regulation.

For Assistance

Hotline: (800) 988-7901

Email: CTAP@idem.IN.gov

Website: www.idem.IN.gov/ctap

The Pollution Prevention Act

United States Code, Title 42 The Public Health And Welfare, Chapter 133 Pollution Prevention

The Pollution Prevention Act of 1990 establishes a national policy that U.S. EPA implements:

"The Congress hereby declares it to be the national policy of the United States that **pollution should be prevented or reduced at the source whenever feasible**;

Pollution that cannot be prevented should be recycled in an environmentally safe manner, whenever feasible;

Pollution that cannot be prevented or recycled should be treated in an environmentally safe manner whenever feasible;

Disposal or other release into the environment should be employed only as a last resort and should be conducted in an environmentally safe manner."

The Pollution Prevention Act (cont.)

U.S. EPA's Source Reduction Clearinghouse

These links offer access to U.S. EPA's information and outreach materials on pollution prevention:

- Pollution Prevention Information Clearinghouse (PPIC)

- PPIC Calendar

- Pollution Prevention Resource Exchange (P2RX)

- Newsletters

- U.S. EPA P2 publications
  - General P2 information and P2 technical assistance

- A-Z Subject Index

- Case Studies

Pollution Prevention (P2) Defined

Pollution prevention (P2) is any practice that reduces, eliminates, or prevents pollution at its source, also called "Source Reduction," rather than trying to control or dispose of it afterwards.

The Waste Management Hierarchy
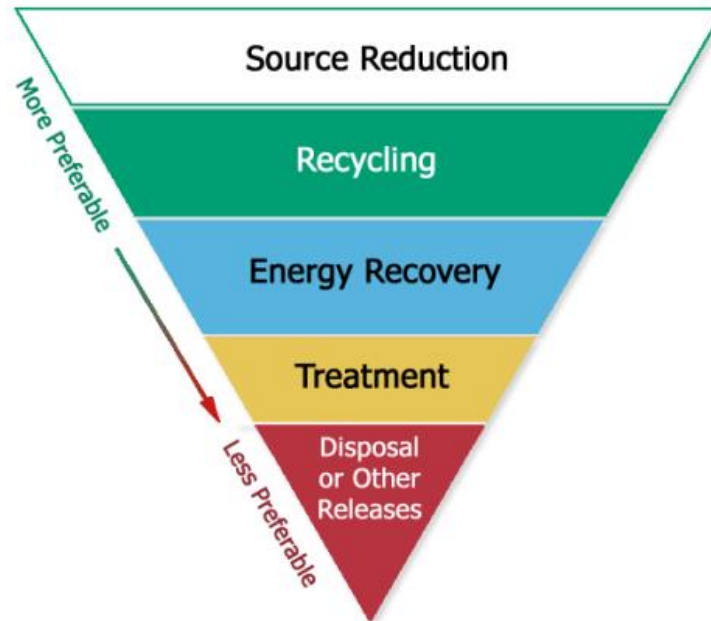
P2 Defined (cont.)

Pollution Prevention (P2) includes:

- Source reduction, which is any practice that:

  o Reduces the amount of any hazardous[1] substance, pollutant, or contaminant entering any waste stream or otherwise released into the environment (including fugitive emissions) prior to recycling, treatment, or disposal; and

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

[1] Hazardous is used in a broad sense to include federally or state regulated pollutants, including Clean Air Act criteria pollutants and Clean Water Act water quality criteria pollutants and conventional pollutants, but excludes items generally considered of low hazard and frequently recyclable or divertible, such as paper products, cans, iron and steel scrap, and construction waste.
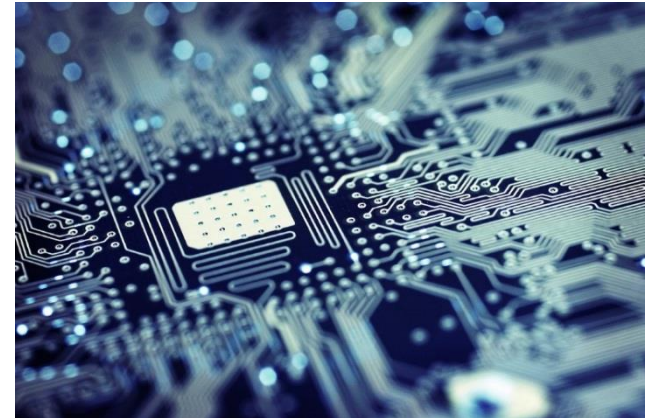
P2 Defined (cont.)

Pollution Prevention (P2) includes:

- 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.
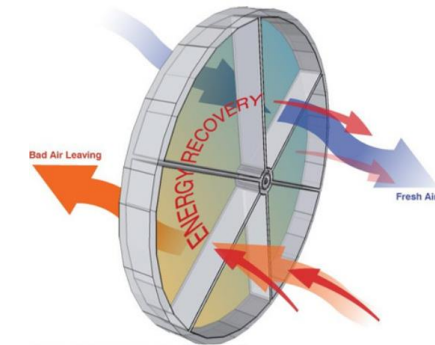
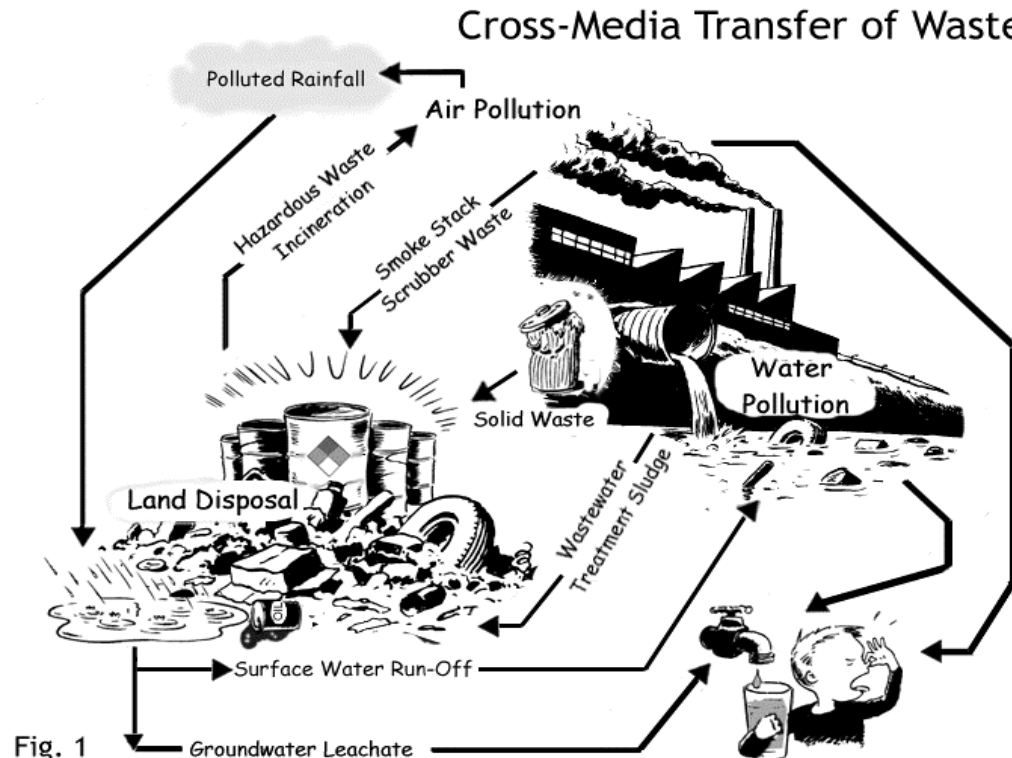# What P2 Does <u>NOT</u> Include

Pollution prevention does <u>NOT</u> include:

- Energy recovery

- Treatment of a waste stream

- Disposal

- Recycling

- Any practice that alters a hazardous
  substance, pollutant, or contaminant once it is generated

- A practice that is not necessary for production

- Practices that create new risks to human health or
  the environment

What P2 Does <u>NOT</u> Include (cont.)

Pollution control and treatment (and some energy recovery and recycling processes) often move the pollution from one medium (air, water, land) to another medium. This is what is known as cross-media transfer of waste.

Cross-Media Transfer of Waste

Polluted Rainfall
Air Pollution
Hazardous Waste Incineration
Smoke Stack Scrubber Waste
Solid Waste
Water Pollution
Land Disposal
Wastewater Treatment Sludge
Surface Water Run-Off
Groundwater Leachate
Fig. 1

The same amount of waste is created, but it is simply moved from one place in the environment to another.

Why Do P2?

Pollution prevention is about increasing operational efficiencies, reducing risk, and effectively meeting environmental responsibilities.

Unlike most pollution control strategies, P2 offers important **economic, regulatory, environmental, and social benefits** that can often result in a more competitive business.

The P2 Process – Step 1

Obtain Management Support

It costs a company labor resources and money to carry out a P2 program. Present sound reasons in order to obtain management support:

- Reduced waste generation/waste treatment and disposal costs
- Reduced raw material consumption/material costs
- Reduced potential liability
- Improved regulatory compliance
- Improved public relations
- Enhanced process efficiency resulting in improved company profits
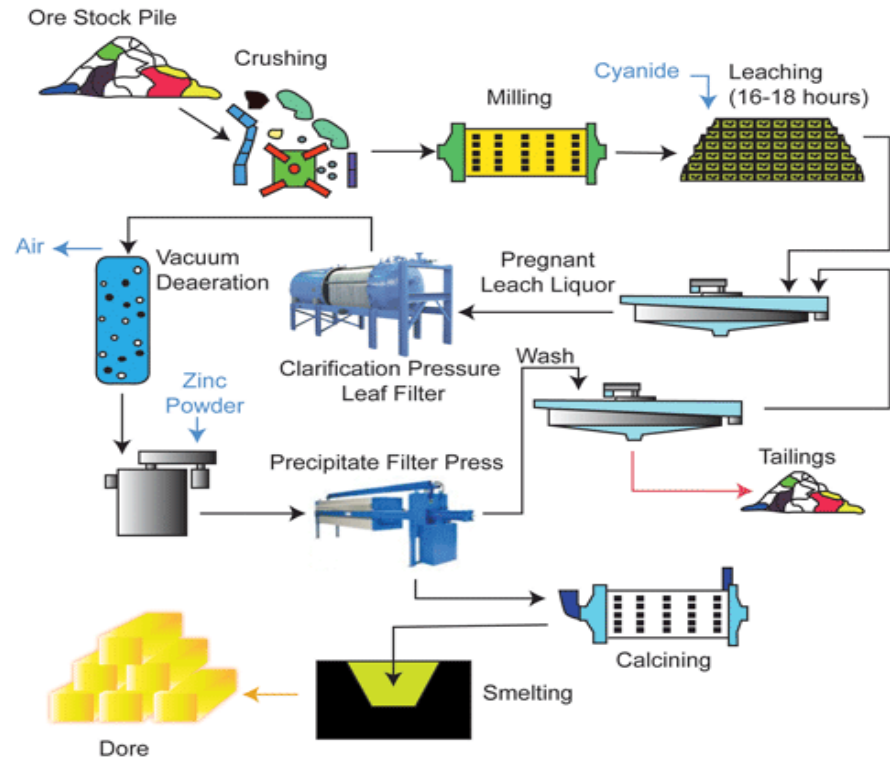- Improved staff productivity

CTAP

SUPPORT

The P2 Process – Step 2

Analyze the Process & Develop a Baseline

❑ Create a general process flow diagram (map) for the entire facility and detailed maps for each process (systematical assessment).

❑ Determine where materials are used and waste is generated.

❑ Tour the facility and ask questions!

CTAP

The P2 Process – Step 2 (cont.)

Analyze the Process & Develop a Baseline

Create detailed itemizations to clarify processes and establish baselines for:

- ❑ **Materials** – Raw materials used (natural and process), source(s) of raw materials, procurement practices, full costs

- ❑ **Work Practices** – Moment-by-moment actions, routes, interrelated activities, dependencies between applications, full costs

- ❑ **Waste Generation** – Process waste, quality control waste, cleanup waste, full costs

- ❑ **Waste Disposal Practices** – Handling, storage, treatment, recycling, transport, final disposal methods, spills and releases, full costs

The P2 Process – Step 2 (cont.)

Analyze the Process & Develop a Baseline

Consider conducting a **Life Cycle Inventory** (LCI) analysis. LCI is a thorough procedure accounting for the environmental loads during the product's life cycle. It is intended to be a "cradle-to-grave" approach and associates a "full cost accounting" from product manufacturing.

The goal of LCI is to compare the full range of environmental effects assignable to products and services by quantifying all inputs and outputs of material flows and assessing how these material flows affect the environment.

Through the use of LCIs, one can identify the aspects of their plant/process that create the most significant environmental loads and act to either substitute raw materials or modify process steps to reduce the generated environmental loads.
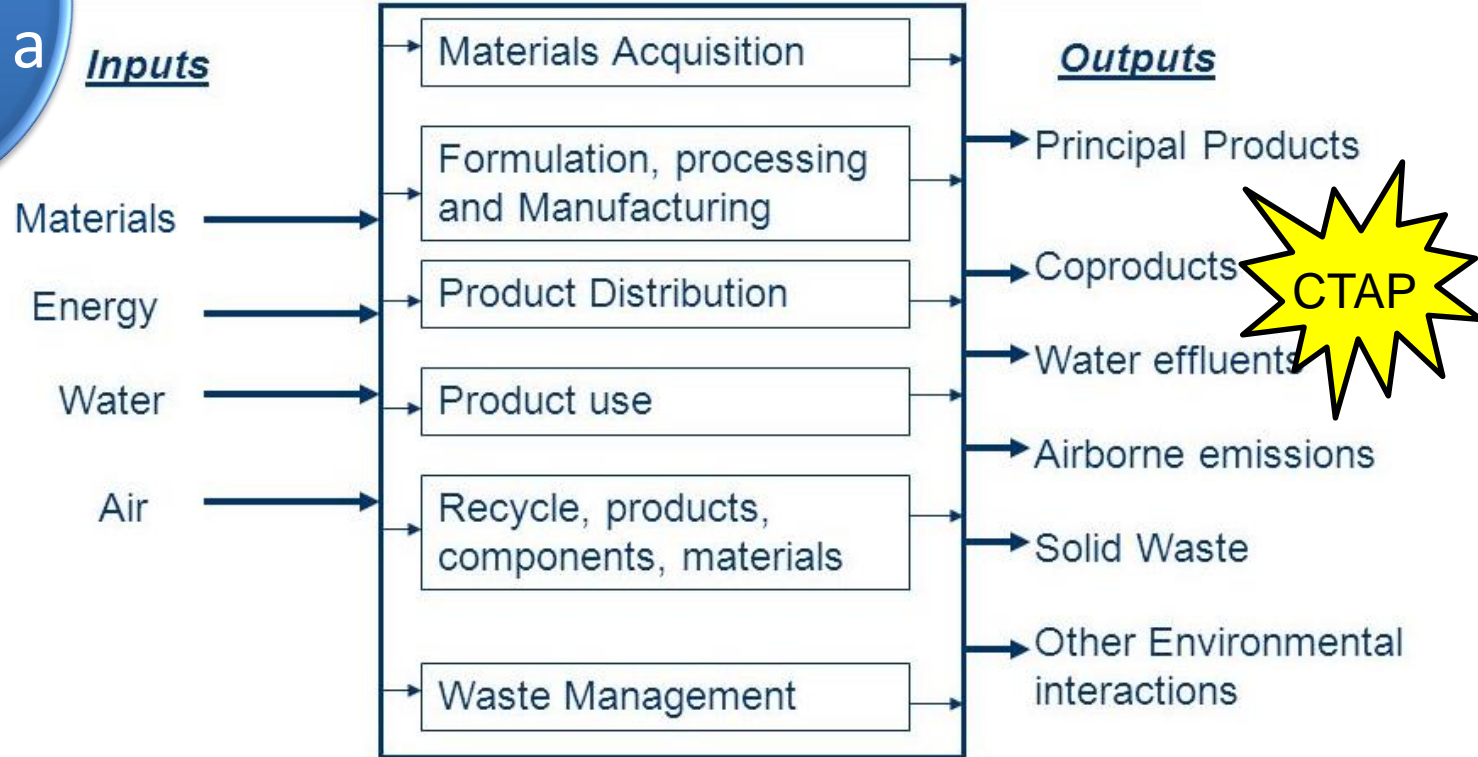
The P2 Process – Step 2 (cont.)

Analyze the Process & Develop a Baseline

Life Cycle Inventory Analysis

CTAP

The P2 Process – Step 2 (cont.)

Analyze the Process & Develop a Baseline

Use this information to select a focus for a P2 project.

Baseline "as-is" → Transition strategy → Target "to be"

Consider concentrating on reducing wastes that fit any of these criteria:

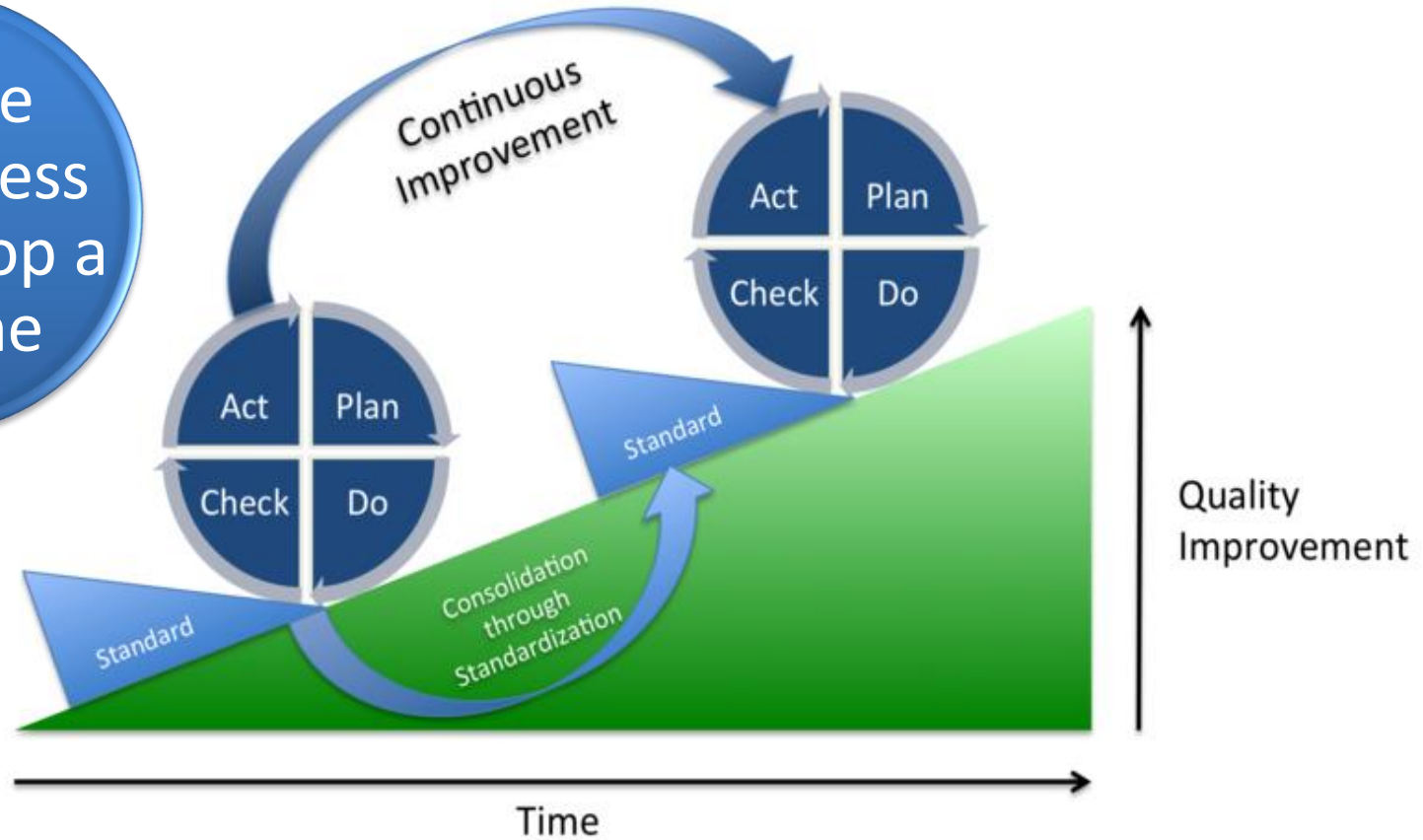- Has the greatest negative impact (environmental or human health)
- Is generated from expensive raw materials
- Requires specialized handling methods
- Is considered to be hazardous or regulated
- Is costly to dispose of
- Is easy to reduce

CTAP

The P2 Process – Step 2 Summary

Analyze the Process & Develop a Baseline

The baselines established now will be the foundations for continuous improvement.

The P2 Process – Step 3

Identify Pollution Prevention Opportunities

❑ Identify operations or processes where implementing P2 practices are possible – Use baselines to identify targets.

❑ Hold a brainstorming session – Include representation from all levels of the organization.

The P2 Process – Step 3 (cont.)

Identify Pollution Prevention Opportunities

❑ Examine obvious waste reduction measures.

❑ Target and characterize problem waste streams.

❑ Develop <u>long-term</u> waste reduction alternatives.

❑ Consider a range of pollution prevention techniques – Use information sources, data systems, and technical assistance services to generate ideas.

CTAP

The P2 Process – Step 3 (cont.)

CTAP

Identify Pollution Prevention Opportunities

Consider the following techniques for each target area:

- ❑ Input raw material modification/substitution
- ❑ Product reformulation
- ❑ Production unit/equipment redesign, modification, or modernization
- ❑ Production process changes/process optimization

- ❑ In-process (integral) recycling/ reuse, or closed loop systems

- ❑ Operational improvements, preventative maintenance, or improved housekeeping

- ❑ Training improvements
- ❑ Best management practices
- ❑ Packaging, shipping, and container changes
- ❑ Waste stream segregation
- ❑ Inventory control

P2 Strategies

Many P2 efforts are inexpensive and simple to implement, often involving only a change in attitude or work procedures.

Businesses can make P2 a routine part of daily operations, just like worker safety and customer satisfaction. A little time and effort can go a long way toward success.

Commonly used methods of P2 include some of the following approaches:

❑ Implementing in-process recycling

❑ Reducing the amount of packaging

❑ Purchasing durable, long-lasting materials

P2 Strategies (cont.)

❑ Implementing water conservation practices by reducing the use of water and chemical inputs to water

❑ Implementing energy conservation practices by increasing energy efficiency and decreasing energy use

❑ Use of environmentally benign fuel sources

❑ Modifying production processes to produce less waste

❑ Using nontoxic or less toxic chemicals as cleaners, degreasers, and other maintenance chemicals

❑ Reusing materials such as drums and pallets rather than disposing of them as waste

❑ Conducting key maintenance activities regularly

Combining Pollution Prevention and Compliance Assistance

- While looking at what regulations apply to the facility, CTAP staff can find ways the company can implement pollution prevention.
- Site visits to assist in looking at processes and waste streams
- Use of checklists and sector guides
- Use of available P2 resources

Combining Pollution Prevention and Compliance Assistance (cont.)

Indiana Department of Environmental Management

A State that Works   IDEM ⌄

Pollution Prevention

About Pollution Prevention

Contact

Information About

CLEAN Community Challenge

e-Waste

Emergency Planning And Community Right-To-Know Act (EPCRA)

Environmental Stewardship Program

Pollution Prevention » Sector Specific Pollution Prevention Guides

Sector Specific Pollution Prevention Guides

Sector Specific Pollution Prevention Guides provide a list of P2 opportunities for reducing waste and pollutant emissions. The opportunities are ranked by cost and amount of waste and emission reductions. They are available in the following categories:

- Chemical Manufacturing [PDF]
- Fabricated Metal Products [PDF]
- Foundry Core Production [PDF]
- Metal Degreasing [PDF]
- Paint Manufacturing [PDF]
- Paper and Pulp Processing [PDF]
- Plastic Processing and Manufacturing [PDF]

Conduct a self-assessment to identify your top three pollution prevention opportunities using the Pollution Prevention Opportunity Self-Assessment [PDF].

Chemical Manufacturing

Pollution Prevention Checklist

✔ Substitute hazardous substances with less hazardous and more biodegradable materials; use less soluble materials and higher purity raw materials.

✔ Increase or optimize production runs to reduce changeover and cleanup.

✔ Optimize mixing and agitation to reduce the use of heat and the generation of undesirable by-products.

✔ Keep lids closed and thoroughly seal reaction vessels; utilize seal-less design pumps and valves.

☐ Recover and reuse spent solvents and catalysts.

✔ Utilize alternative separation technologies such as distillers, membranes…etc. rather than solvents for the purification process.

✔ Sequence the addition of reactants and reagents to optimize yields and lower emissions.

✔ Select reactor operating temperature at or near ambient temperature, when possible.

✔ Use hot process steam to heat feed (if required); utilize waste heat to preheat materials

✔ Improve reactor mixing to increase the effectiveness of catalysts; use more select catalysts to reduce ge_____, eliminate catalysts containing heavy metals.
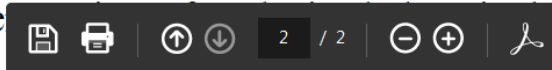
✔ **= Less Air Emissions – Potential Reduction in applicable regulations**

Chemical Manufacturing (Cont.)

☐ Find an outlet market for by-products.

✓ Implement a training program for employees on proper handling and disposal techniques of raw materials, by-products and wastes. Implement a documented preventive maintenance program on all reaction vessels, pipes, control valves, pumps, centrifuges, distillation columns and filter presses.

☐ Receive materials in bulk or ship by pipeline (if possible).

☐ Dike or secondary contain process vessels and storage tanks.

☐ Eliminate storm water intrusion into process operations and sanitary waste streams.

Fabricated Metal Products

Pollution Prevention Checklist

- ✓ Replace oil lubricants used in cold forming operations with a hot lime bath or borax soap to reduce or eliminate the need for cleaning solvents.
- ✓ Utilize dry cutting or laser machining technologies if feasible; reduce the amount of lubricant if possible.
- ✓ Review manufacturing process to eliminate redundant cleaning of metal products. Can part degreasing be eliminated? Surface coating?
- ✓ Use stamping lubricants that remain on the part until the annealing process where they can be burned off, reducing or totally eliminating the need for cleaning solvents.
- ✓ Replace traditional solvent cleaners with low HAP/VOC, aqueous-based cleaners, ultrasonics or a combination.
- ✓ Replace solvent-borne surface coatings with water-borne or low VOC/HAP, high solids coatings.
- ✓ Convert surface coating applications to high efficiency, low VOC emitting technologies such as electrostatics, high volume low pressure (HVLP) guns or powder coating.
- ✓ Schedule production for longer product runs to reduce equipment flushing and cleaning.
- ✓ Replace solvent based cleaners with recycled high pressure water-based cleaning/phosphate systems to reduce VOC and HAPs.
- ✓ Reduce drag-out from degreasers by allowing parts to drip back into the degreaser tank. Install tank covers that automatically close during the plating operation.
- ✓ Train employees to keep all containers closed to reduce air emissions and preserve the chemical properties of the coatings and solvents (this includes all containers used to store coatings, solvents, additives, and liquid waste materials).

Metal Component Degreasing

Pollution Prevention Checklist

✓ Replace solvent-based degreasers units with aqueous-based degreasers, ultrasonic cleaners, or terpene-based cleaners.

✓ Does the process possess the potential to eliminate part degreasing? Does redundant part degreasing exist in the process? Can the use of lubricants be reduced?

☐ Can the residue be burned off in a later process such as annealing?

✓ Keep the degreasing unit covered; develop Standard Operating Procedures (SOPs) to ensure the unit is covered the majority of time.

✓ Avoid heating the cleaning fluid to eliminate air releases.

☐ Would agitation in the tank improve the cleaning effectiveness?

✓ Reduce drag-out from the degreasing unit by allowing parts to drip back into the degreaser tank and installing drip pans to collect residue.

✓ Minimize rack and fixture size to reduce drag-out from the degreasing unit.

☐ Reclaim and reuse the cleaning substrates.

P2 Resources

❖ IDEM – Industry Sector-Specific Pollution Prevention Guides

❖ U.S. EPA Pollution Prevention

❖ Toxics Use Reduction Institute (TURI)

❖ Great Lakes Regional Pollution Prevention Roundtable

Questions About This Presentation?

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