

Pollution Prevention — Getting Started

Information for Business and Industry

Establish Top Management Support

Support and direction from top management are critical to the development and implementation of successful pollution prevention (P2) activities. Support from top management can be developed by showing important cost savings and environmental benefits that can be achieved through P2. With top management buy-in, a company policy statement on P2 can be developed along with reduction goals. The company policy and goals will help clearly demonstrate to staff a commitment to P2.



Get Employees Involved

Studies show that companies with employee involvement have more successful P2 activities than those without. Organize a cross-functional team and empower them with the responsibility for P2 activities. Consider naming a “P2 coordinator” to head-up the team. Get all employees involved through training and education efforts and incentive programs. For more on employee involvement, see Ohio EPA’s Office of Pollution Prevention (OPP) fact sheet number 22, “*Enhancing Employee Involvement in Pollution Prevention Activities.*”

Track Waste Costs

Identify all sources of waste from your operations and calculate their “full” cost. Include purchase (raw material), treatment, disposal, compliance and other related costs. Allocate these costs to specific processes, operations or departments; not overhead.



Communicate these waste costs to staff. Focus P2 efforts on wastes that are most costly and difficult to manage. For more on waste costs, see OPP fact sheet number 72, “*Waste: What is it Really Costing You?*”

Conduct Periodic P2 Assessments

Use a team approach and conduct a P2 assessment of facility operations and processes that generate waste. The P2 assessment will help identify specific source reduction and recycling ideas. Consider using problem-solving tools like process mapping, materials accounting, cause-effect analysis, and brainstorming. Implement those P2 ideas that are economically and technically feasible. Consider using an outside resource like OPP to help conduct the P2 assessment.



Measure Results and Continuously Improve

Measure the results of your P2 activities through money saved and pounds of pollution prevented. Document and publicize these successes to your employees, customers, vendors (suppliers), community and regulatory officials. Evaluate your P2 activities and implement changes to policies, goals and program activities to ensure continuous improvement.



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Ohio P2 Success Stories

American Electric Power, Muskingum River Plant

The plant established a P2 task force consisting of supervisory and hourly personnel. The task force was instrumental in implementing the P2 program and integrating its principles into all phases of work planning.

All employees are challenged to identify and implement P2 initiatives. Successful ideas are communicated throughout the plant, company and AEP system with “Pollution Prevention Success Stories.” Employees are awarded gifts for submitting an original idea. Muskingum River Plant’s program has been successfully modeled at other AEP power plants and facilities.

Economic and Environmental Benefits

- 🌍 Implemented a process improvement effort that eliminated the need to burn 36,047 tons of coal, which reduced the plant’s sulfur dioxide emissions by 2,562 tons, ash by 4,370 tons, carbon dioxide by 88,848 tons, hydrochloric acid aerosol by 69,211 tons, and hydrofluoric acid aerosol by 5,047 tons;
- 🌍 Reduced river water consumption by 1.25 million gallons per day;
- 🌍 Reduced the use of sodium hydroxide by 92.5 tons and sulfuric acid by 114.8 tons from 1996 to 1997; and
- 💰 Identified fuel savings of \$1.5 million from process and efficiency improvements completed from 1996 to May 1999.

For more information:

James Ludwig
Plant Environmental Coordinator
(740) 984-3468

General Extrusions, Inc., Youngstown

General Extrusions, Inc. (GEI), is committed to its environmental policy statement which pledges to eliminate or greatly reduce use of substances that are harmful to the environment. Prevention of pollution **at the source** is the preferred method to achieve its environmental goals.

GEI also established a reporting commitment that recognizes the importance of reporting all reductions achieved through P2 activities.

Economic and Environmental Benefits

- 🌍 Eliminated the generation of paint and solvent hazardous wastes associated with the wet spray process by switching to a powder coating process. GEI also eliminated VOC emissions associated with the wet spray line from a baseline of 4,100 pounds in 1992 to 0 pounds in 1998 while increasing productivity threefold;
- 💰 Changed from an alkaline product to a dispersion cleaner that was chrome-free. The new dispersion cleaner yields a longer tank life, which saves \$4,000 per year;
- 💰 Purchased 5,000 polyethylene sheet dividers to replace cardboard dividers. GEI saved \$6,200 in 1998 and \$20,500 in 1999 by substituting for cardboard dividers. The polyethylene dividers also divert 105 cubic yards of cardboard per year from landfills; and
- 🌍 Significantly reduced its water usage from nearly 250 gallons per minute (gpm) to just more than 50 gpm, an 80 percent reduction. This relates to a savings of more than 30,000,000 gallons per year, and \$1,400,000 in accumulated savings from 1990 through 1998.

For more information:

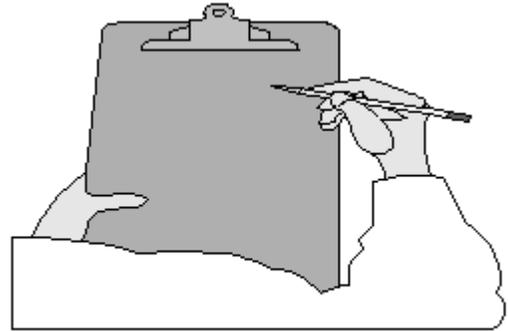
Louis Caralla
Anodizing Superintendent
(330) 783-0270

Pollution Prevention Planning Checklist

As you begin to develop P2 activities for your facility, review the following checklist. It is detailed enough to make sure your main bases are covered; however, you'll want to add some of your own specific ideas.

Program Development

- Develop a written pollution prevention policy supported by top management.
- Establish ambitious and measurable P2 goals.
- Periodically evaluate P2 program activities and promote continuous improvement.
- Designate a P2 coordinator and team.
- Plan to involve employees early on when making decisions on P2 projects and activities.
- Create an incentive program to get all employees involved with P2.
- Conduct periodic P2 assessments of processes and operations.
- Use problem solving tools like process mapping, materials accounting, cause-effect analysis, and brainstorming for P2 assessment activities.
- Evaluate P2 ideas considering cost, ease of implementation, payback and environment benefit.
- Establish and maintain a waste tracking system.
- Determine full cost of wastes from operations and processes.
- Develop an implementation schedule for P2 activities.
- Measure and communicate the results and benefits of P2 activities.
- Identify resources for technical assistance, including the local Chamber of Commerce, trade associations, state and local agencies, equipment vendors, consultants and other businesses.



Examples of P2 Activities



- ☑ Establish improved quality assurance/quality control procedures to reduce the generation of rejected products.
- ☑ Identify potential production changes that would improve efficiency including process, equipment, piping and layout changes.
- ☑ Consider procedural measures, loss prevention, material handling improvements and production scheduling to reduce wastes.
- ☑ Investigate “non-toxic” or “non-hazardous” alternatives for material substitutions.
- ☑ Segregate all waste streams to reduce contamination of recoverable materials.
- ☑ Investigate waste exchange programs for both solid and hazardous waste.
- ☑ Replace disposable materials with reusable and recyclable materials.
- ☑ Investigate the use of returnable and/or recyclable containers and pallets.
- ☑ Identify specific waste materials that could be recycled either on-site or off-site.
- ☑ Explore the use of recovery equipment for reducing hazardous, solid and liquid wastes in the form of sludges, solvents, acids, degreasers and other wastes.
- ☑ Purchase materials in bulk or larger containers, but purchase only what you need to avoid spoilage or obsolescence.
- ☑ Control inventory to reduce waste; rotate stock, using oldest purchases first.
- ☑ Invest in products and equipment that are durable, easily repaired, and/or recyclable.
- ☑ Ask vendors to minimize unnecessary packaging, use recycled materials, or use returnable packaging.
- ☑ Determine if outdated stock can be returned to suppliers for reuse or reformulation.
- ☑ Don't accept product samples from sales people if there is a chance the samples will become a waste.
- ☑ Look for opportunities to reduce energy and water use.

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Success Stories continued from page 2

American Tool Companies, Inc., Wilmington Operations

American Tool has waste minimization teams, which meet monthly to discuss ideas about reducing the amount and toxicity of wastes generated at the Wilmington facility.

Management uses a rewards and recognition program to encourage employees to participate. Ideas and new activities from the waste minimization teams are communicated to the rest of the employees in monthly staff meetings.

Economic and Environmental Benefits

- ♻️ Reduced hazardous waste generation through material substitution, source reduction, better equipment maintenance, and employee education from more than 40,000 gallons annually to less than 2,000, a 95 percent reduction; and
- 💰 Saved more than \$750,000 in hazardous waste disposal costs over a seven year period.

For more information:

Jeffrey Curry
Health & Safety Manager
(937) 382-3811

Ashland Chemical Company Foundry Products Division, Cleveland

To explore options for P2 and waste reduction, a multi-disciplinary waste reduction team was formed with representatives from each department. The team's first goal was to determine all the sources of waste generated at the plant. They then set a waste reduction goal in terms of cost per pound of production. The team used quality problem-solving tools to help identify and evaluate P2 solutions.

Economic and Environmental Benefits

- ♻️ Reduced overall waste by 15 percent while increasing production by 30 percent; and
- 💰 Saved \$36,000 or 40 percent per pound of production in disposal costs.

For more information:

Rich Medykowski
Laboratory Supervisor
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Neaton Auto Products Manufacturing, Inc., Eaton

Neaton developed a proactive and successful P2 program addressing hazardous material reduction, energy conservation, and recycling. Neaton used problem-solving techniques to help improve every area of its manufacturing facility to reduce wastes and associated costs.

Management commitment was demonstrated by the creation of a resource recovery administrator position, a P2 program and team, and periodic associate surveys (P2 assessments). P2 was also incorporated into Kaizen (continuous improvement) efforts.

Economic and Environmental Benefits

- ♻️ Saved an estimated \$333,000 in reduced paint usage as a result of paint line improvements;
- ♻️ Reduced solid waste disposal by 1,966 tons through internal scrap reduction and plastic recycling projects, which saved more than \$191,000 in material and disposal costs; and
- 💰 Saved more than \$524,000 in 1998 from paint line improvements, internal scrap reduction and plastic recycling projects.

For more information:

Charles McDaniel
Assistant Manager of Environmental Health & Safety
(937) 456-7024

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Tips for Small Businesses

- ④ Target one material for reduction when getting started.
- ④ Initially focus on P2 ideas that require minimal capital investment.
- ④ Involve all employees in planning and implementation.
- ④ Contact the Office of Pollution Prevention, the Small Business Assistance Office or other technical assistance providers for help in getting a P2 program started.

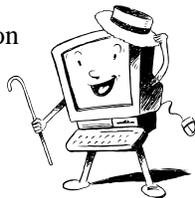


Cleveland Advanced Manufacturing Program
Prospect Park Building, 4600 Prospect Avenue
Cleveland, Ohio 44103
(216) 432-5300 or (800) NOW-CAMP
www.camp.org

TechSolve, Incorporated
1111 Edison Drive
Cincinnati, Ohio 45216-2265
(513) 948-2000 or (800) 345-4482
www.techsolve.org

Additional sources of information:

Ohio EPA - Office of Pollution Prevention
P.O. Box 1049
Columbus, Ohio 43216-1049
(614) 644-3469
www.epa.state.oh.us/opp



Ohio Pollution Prevention and Waste Minimization Planning Guidance Manual. Ohio EPA-OPP. Sept. 1993

Facility Pollution Prevention Guide. EPA/600/R-92/088. U.S. EPA. May 1992.

Ohio EPA - Small Business Assistance Office
3232 Alum Creek Drive
Columbus, Ohio 43207
(614) 728-8573 or (800) 329-7518
www.epa.state.oh.us/other/sbao/sbaindex.html

U.S. EPA Risk Reduction Engineering Laboratory/
Pollution Prevention Research Branch
26 W. Martin Luther King Drive
Cincinnati, Ohio 45268
(513) 569-7215
www.epa.gov/ORD/NRMRL

Other helpful fact sheets available from OPP

OPP fact sheets covering general P2

- # 1 What is Pollution Prevention?
- #22 Enhancing Employee Involvement in Pollution Prevention Activities
- #33 Financial Analysis of Pollution Prevention Projects
- #72 Waste: What is it Really Costing You?

P2 Case Study fact sheets

- #53 Governor's Pollution Prevention Award Recipient - American Tool Companies, Inc., Wilmington Operations
- #54 Governor's Pollution Prevention Award Recipient - Ashland Chemical Company Foundry Products Division
- #77 Governor's Pollution Prevention Award Recipient - Neaton Auto Products Manufacturing, Inc.
- #80 Governor's Pollution Prevention Award Recipient - General Extrusions, Inc.
- #81 Governor's Pollution Prevention Award Recipient - American Electric Power, Muskingum River Plant

www.epa.state.oh.us/opp

The Office of Pollution Prevention was created to encourage multi-media pollution prevention activities in Ohio to reduce risk to public health, safety, welfare and the environment. Pollution prevention stresses source reduction and, as a second choice, environmentally sound recycling, while avoiding cross media transfers. The Office develops information related to pollution prevention, increases awareness of pollution prevention opportunities, and can offer technical assistance to business, government, and the public.



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