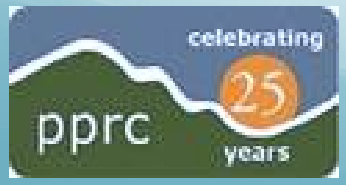
POLLUTION PREVENTION

identifying potential opportunities for reducing air toxics



Pacific Northwest Pollution Prevention Resource Center

practical solutions for economic and environmental vitality

what is pollution prevention?

- At its simplest, pollution prevention (P2) is avoiding the generation of all types of pollution
- *The Pollution Prevention Act of 1990* established a federal policy that **pollution should be prevented or reduced at the source**, and when pollution cannot be prevented, it should be recovered and reused (internally or externally) or recycled in an environmentally safe manner
- P2 intends to broaden our thinking, to eliminate the silos that move pollution from one media to another, and to promote a strategy for reaching zero emissions & zero waste (circular economy)
- Reducing the amount of pollution produced means less waste to control, treat, or dispose of
- Less pollution means less hazards to public health and the environment

P2 programs

- Activities or strategies that—
  - eliminate or reduce the generation of nonproductive output, air emissions, wastewater, waste, or harmful substances in products
  - conserve water or energy
  - eliminate or reduce the use of toxic substances
  - eliminate or reduce the risk to communities and populations

the principal elements

- Source reduction—applying a systematic approach to eliminating or reducing all pollutants and their risk to people and the environment

- Toxics use and community risk reduction—
  - designing chemical processes and products that reduce or eliminate the need for use and generation of harmful substances
  - understanding the releases or effluent streams of toxic materials and their potential impact zones in our communities, single or multiple, and overlapping
  - evaluating potential exposures and potential risks
  - reducing and mitigating the risk to populations and individuals

systematic source reduction—how?

- Evaluating material use—the inputs, including:
  - feedstock materials, ingredients, and contaminants
  - processing materials, ingredients and contaminants
  - how toxic are the materials and which toxics, if any, can be eliminated from use or substitutes found (sometimes called green chemistry)
- Looking at production processes—the process and changes, including:
  - closed and open cycles
  - material use and changes—what is used up, what is generated by the process, what is wasted by the process and released into the air, the wastewater, or as solid or hazardous waste
  - energy and water used by the process
- Evaluating products, byproducts and waste—the outputs, including
  - what toxic materials are in the products, byproducts, and waste
  - what changes can be made to eliminate, capture, reuse and/or recycle the byproducts and waste at the source

changing the sequence

- Educating and motivating P2 thinking
- Eliminating use and scrap
- Substituting less toxic materials
- Changing the production processes
- Adding control technology (—is it really sufficient?)
- Identifying the gaps in existing technology and moving toward more advanced solutions—disruptive innovation

example: emissions reduction

Canyon Creek Cabinet Company and PPRC

- ***Finding***: VOC emissions > 150,000 lbs per year were pushing the company close to a Title V air permit. One high VOC topcoat material was applied twice to each cabinet panel.
- ***Solution***: An alternative one coat product was evaluated, tested and substituted resulting in less overall VOC released for their coatings
- *Results*: Reduced VOC emissions by 114,535 lbs per year. Will not need to file for Title V air permit even with a 70% increase in production.

community toxics risk reduction

- When do we need to look at cumulative risk to communities or populations—multiple pollutants, multiple sources?
- What factors make a toxics issue a priority?
- Building an investigatory framework
- Developing a holistic approach for identifying sources, evaluating their relative priority, and looking for loose ends
- Quantifying potential releases, concentrations and loadings, current and legacy
- Understanding fate, transport, and behavior in the environment and through food chains
- Determining the potential for exposure, significance, health effects, environmental harm (real, probable, potential future risk)

(continued)

- Exploring existing solutions and identifying gaps
- Evaluating how existing and future regulations or limits could alter the potential for future risk
- Investigating the applicability and potential of developing innovative, technical solutions
- Partnering with key resources to further develop and test, pilot, and implement innovative solutions
- Continuously questioning, checking, rechecking, and re-evaluating (looping)