

DRAFT (7/16/10)

Types of Strategies to Reduce Toxic Chemicals

Specific strategies to reduce toxic chemicals fall into many categories, with most falling into more than one category. Using categories will help organize the strategies. In addition, because the strategies within each category may share common features, the categories will aid in evaluating strategies' effectiveness.

The strategies for reducing toxic chemicals in the environment and in humans can be divided into three general categories:

- Measures to prevent pollution;
- Measures to control pollution; and
- Measures to reduce exposure to chemicals.

Measures to **prevent pollution** are designed to reduce the production of toxic chemicals at the source through changes in manufacturing processes or materials used. A simple example is switching to less toxic chemicals.

Measures to **control pollution** focus on management actions or technology designed to prevent or reduce the release of toxic chemicals to the environment. Examples include air contaminant controls on a smokestack or wastewater treatment equipment; each removes toxic chemicals before they enter the environment.

Measures to **reduce exposure** refer to actions that decrease harm to humans and the environment from chemicals that have been released. These might be used when prevention or control of a toxic chemical is not possible or reasonable, or in cases where releases may have occurred many years ago. An example is encouraging households with potentially unsafe levels of a contaminant in their drinking water wells to switch to bottled water.

Below is a description of different types of strategies that fall into these general categories, organized by the mechanism used to put each into effect. There is another category described below: *supporting strategies* that would allow DEQ and other organizations to assess the scope of problems caused by toxic chemicals and measure the effectiveness of actions to reduce them.

Types of Direct Strategies

1. Direct Regulatory Strategies

Actions in this category derive from DEQ's regulatory authorities to control pollution. They:

- Limit or prohibit the use or release of toxic chemicals;
- Require disclosure of industrial processes or chemicals used;
- Require *producer responsibility* (including in the final market price of a product the life-cycle environmental costs associated with its production and distribution); or
- Require removal from the environment.

These types of strategies rely on rules, permits, and orders enforced through civil penalties. Such strategies require regulatory agencies to develop, maintain, and enforce the new regulations. As appropriate, DEQ may recommend the growth or redirection of existing programs or creation of new regulatory programs to reduce specific toxic chemicals.

2. Incentive Strategies

Strategies in this category can be included in direct regulatory programs to provide incentives to reduce specific chemicals voluntarily. Their goal is to reduce toxic chemicals with fewer regulatory or financial burdens for those generating or using the chemicals. Such incentives might be designed to:

- Encourage actions beyond regulatory compliance (for example, toxics use reduction);
- Promote continuous improvement beyond compliance;
- Enhance proper management of toxic chemicals (e.g., waste-collection events); or
- Spur creative thinking about actions not required by underlying regulatory programs.

Incentive strategies follow the “dangling a carrot” approach and are typically, although not necessarily, a component of a regulatory program. These strategies require attentive regulatory agencies that are willing to monitor and verify toxic-chemical reduction.

3. Chemical Replacement Strategies

The objective of these strategies is to identify and promote the use of non-toxic chemicals in industrial products and processes, through, for example, research into green chemistry. Chemical replacement strategies will likely require a combination of direct regulation (e.g., prohibitions or restrictions on the use of certain chemicals) and voluntary substitutions by manufacturers. It will be important that replacement chemicals be safe and not create other problems. Replacement strategies can also function alongside market-based actions, especially in the area of consumer products. At their most effective, these strategies will reduce toxic chemicals at the source. In some cases, they could require a regulatory agency’s verification, monitoring, and oversight.

4. Market-Based Strategies

Relying on the marketplace to provide toxic reductions, these strategies might include:

- Product Labeling
- Product Certification
- Product Stewardship / Producer Responsibility
- By-product trading programs (“one person’s trash may be another person’s treasure”). It will also result in a double savings because company A won’t have to dispose of the toxic chemical, and company B won’t have to create even more of the chemical.

Examples of market-based strategies include organic labeling, “Salmon Safe” certifications, Eco-Biz certifications, and EPA’s Design for Environment. These strategies are voluntary and can effectively reduce toxic chemicals with little effect on manufacturing processes. Certification can occur through private, independent entities or government agencies charged with verifying claims of toxic-chemical reduction.

5. Intergovernmental Coordination Strategies

Toxics reductions might be enhanced by improving coordination among public agencies. This could involve creating either formal structures to foster coordination between existing agency programs, or less formal ways to improve interagency communications. This could also involve coordination among agencies that have not worked together in the past. The objective of these strategies would be to use government knowledge and capabilities more efficiently to achieve greater reductions in toxic chemicals than would occur without such coordination.

6. Financial Strategies

These strategies would rely on financial tools to achieve reductions and might include:

- Taxes on the sale of certain chemicals;
- Taxes on discharges of certain chemicals; or
- Credits for effectively reducing certain chemicals.

These options can provide significant incentives for reducing chemicals at the source. They commonly require governmental action, verification, and oversight. One example: DEQ's Dry Cleaner program levies a fee on the sale of dry-cleaner solvent, which has contributed to a steady decrease in the use of this toxic chemical in Oregon. (DEQ uses the funding to clean up the most contaminated dry-cleaner sites.)

7. Educational Strategies

Educational strategies can provide relevant information to consumers, businesses, and industrial users of toxic chemicals, using such tools as technical assistance, workshops, and other outreach. These actions are typically performed by regulatory agencies, but could also include significant involvement of private entities, universities, and others. They may include information about replacement chemicals, alternative process or approaches, safer handling, and many other topics.

Types of Supporting Strategies (Monitoring, Measurement and Assessment)

Supporting strategies can provide information about the presence of toxic chemicals in the environment at various locations and through time, and can also support measurements of toxic chemicals released or discharged into the environment. They might include:

- Identifying the source of the toxic chemical;
- Ambient environmental monitoring;
- Biological indicator monitoring;
- Biosolids monitoring;
- Watching for changes in sediment quality;
- Evaluating drinking-water intake systems;
- Judging effectiveness of direct strategies; or
- Modeling and assessment of key environmental media at strategic locations.

Both private entities and public agencies can adopt supporting strategies, and they can be either voluntary or regulatory in nature. They tend to focus on toxic chemicals already released to the environment or on current releases and discharges. Supporting strategies do not directly reduce toxic chemicals, but provide the basis for evaluating environmental conditions, which in turn can provide a basis for adopting direct strategies. Supporting strategies may range from the relatively simple, such as direct measurement, to the complex, such as mathematical representations of ecosystems.