TOXICS USE REDUCTION
FROM POLLUTION CONTROL TO
POLLUTION PREVENTION

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INTRODUCTION


These state and federal laws set restrictions on the release of toxic pollutants into the nation's air, land, water and workplaces. During the 1980's they have been updated and complemented by federal and state Superfund laws mandating the cleanup of sites where dangerous toxins have accumulated.

Altogether, the Congressional Office of Technology Assessment estimates that a whopping $70 billion is spent annually by industry and government to comply with this seemingly substantial body of environmental protection laws. (1)

Yet, this regulatory scheme is not enough. Consider the following:

- According to a recent study by the Center for Responsive Law, 19% of all water systems tested nationwide have shown some level of toxic contamination. (2)

- Toxic compounds are detectable in the body tissue of most, if not all, Americans. Recent tests by EPA's National Human Adipose Survey show that probably all Americans have toxic compounds stored in their fatty tissues; in fact, 100% of the samples in one recent test contained styrene, xylene isomers, 1,4-dichlorobenzene and ethylphenol. Some of these chemicals are known or suspected to cause cancer, birth defects and other health problems. (3)

- Of more than 59,000 chemicals used in the workplace nationwide, the Occupational Safety and Health Administration has developed safety standards for only 23. (4)

- Literally billions of pounds of toxic compounds are emitted without restriction into the air Americans breathe each year. These toxic emissions result in thousands of cases of cancer annually, acute illness, and chronic respiratory problems. A 1985 EPA study of just 45 substances concluded that these chemicals cause up to 1700 cancer cases in the U.S. each year. Currently, only seven toxic air pollutants are regulated. (5)

- A recent government assessment estimates that more than 560 million tons of industrial toxic wastes are produced annually in the United States. That's more than two tons of hazardous waste produced for every U.S. citizen each
WHAT WENT WRONG?

With all of the existing laws, why are people across the nation exposed to toxic risks on a daily basis? To understand this problem, consider the history of chemical production and use since World War II. In 1940, the entire U.S. economy produced less than 1 million tons of synthetic organic chemicals. By 1950, annual production had jumped tenfold to 10 million tons, and it continued to increase until, by 1987, 125 million metric tons of synthetic organics were produced. The fact is that chemical use has increased so quickly that the laws are still trying to catch up.

Another contributing factor is that the existing body of environmental laws suffer from a number of inherent weaknesses that seriously limit their effectiveness in providing full protection. These weaknesses are:

1. **A misplaced focus on the end of the pipeline:** Instead of directly ensuring reduction in the use of toxics, present laws focus on controlling wastes already produced, implicitly sanctioning toxics use.

2. **Missed economic opportunities:** Instead of spurring industrial innovation, these laws encourage investment in costly pollution control technologies which increase production costs, often without effectively destroying or neutralizing toxins.

3. **Lack of coordination between laws:** Each of the existing laws focuses on only one environmental medium (air, water, land, or workplace); as a result, regulators charged with enforcing the laws suffer from “tunnel vision” and fail to grasp the total picture promoting waste and noncompliance.

4. **Regulatory asymmetry and the “toxics shell game”:** Besides being media-specific, various environmental and workplace protection laws set different allowable limits on releases of different sets of substances. Consequently, firms often can legally shift their waste streams between environmental media to come into compliance with narrowly written laws, rather than actually reducing their output of waste.
5. **Data gaps:** Current laws do not provide the information that public officials need to identify the greatest risks to workers, communities and the environment. Such information is critical to the establishment of priorities for effective environmental action.

Given these regulatory limitations and greatly increased chemical use it is not surprising that present laws and the pollution control methods they sanction do not achieve a satisfactory level of environmental protection.

**TOXICS USE REDUCTION: A NEW STRATEGY BASED ON PREVENTION**

What must be done? We believe the answer is to complement the existing legal and regulatory scheme with a much more positive, proactive system designed specifically to prevent toxic exposures.

The best way to do this is through “toxics use reduction.” We define toxics use reduction to be:

*changes in production processes, products or raw materials that reduce, avoid, or eliminate the use of toxic or hazardous substances or the generation of hazardous byproducts per unit of production, so as to reduce overall risks to the health of workers, consumers or the environment without shifting risks between workers, consumers or parts of the environment.*

Toxics use reduction can be achieved through any of the following five methods:

1. **Substituting toxic chemicals used in production processes:** Industry can change the raw materials that it uses, substituting non-toxic or less toxic substances for highly toxic ones. For instance, Cleo Wrap, the world’s largest producer of gift wrapping paper, converted from organic solvent-based inks to water-based inks in all of its operations, preventing the release of up to 133,555 kilograms of hazardous waste per year. (7)

2. **Changing the end product:** This involves a firm changing the design of a product in such a way that its production becomes less toxics-intensive. For instance, 3M changed one product in order to use a nonhazardous organic material instead of a metal alloy in its manufacture, thus eliminating a waste stream bearing cadmium. (8)

3. **Modifying or modernizing the production line:** This involves making fundamental process changes by replacing production equipment and technologies. For example, Hill Air Force Base in Ogden, Utah altered its method of stripping paint from aircraft by replacing chemical solvents with sandblasting equipment. The sandblasting technique utilizes plastic beads which scrape off the paint and then are separated from the paint dust and reused. This prevents the introduction toxins into the chemical waste stream, and moreover reduces the exposure of workers to the hazardous solvents. (9)

4. **Better Housekeeping:** By improved monitoring, industry can more precisely identify production of costly and poisonous waste and plug up the toxics “leaks” they discover. This is often the simplest and most rudimentary form of toxics use reduction. For example, Exxon Chemical installed floating roofs over tanks of volatile organics, thereby reducing evaporative losses of valuable products and reducing a hazardous waste stream into the atmosphere. (10)
5. **Recycling materials within production processes:** Firms can reduce waste streams while recovering valuable materials by creating closed loops within processes that recycle certain substances. This type of recycling is distinguished from out-of-process recycling, which may reduce toxics use but may also create such additional risks as worker exposure and transportation hazards. For this reason, in-process recycling is preferable, and subsequently is the only type of recycling considered to be a true method of toxics use reduction.

## TOXICS USE REDUCTION vs. WASTE REDUCTION

A cursory look at the available literature, especially the Congressional Office of Technology Assessment's report, *Serious Reduction of Hazardous Waste*, may lead one to think that toxics use reduction, as defined here, is nearly identical to another preventive strategy, hazardous waste reduction (or, as it is sometimes called, source reduction). While it is true that the list of five methods by which each is properly achieved is the same, there is a subtle, yet very important difference between the two strategies.

**Waste or source reduction** is a strategy designed to reduce the amount of waste generated by a firm. As such, it is not explicitly a strategy to reduce all of the hazards associated with toxics use, including transportation accidents, worker exposure and consumer exposure.

For example, a firm can properly practice waste reduction by simply incorporating toxic constituents into the product itself. For instance, Monsanto reformulated an industrial adhesive so that hazardous wastes remained in the product, thus eliminating its own waste stream; however, the net effect of this strategy was to make the product itself more toxic to the consumer, as well as to the solid (garbage) waste stream after being discarded by the consumer. Although this method fits the definition of waste reduction, it did not constitute toxics use reduction, because Monsanto continued to use the same amount of the hazardous substance as it had before. It simply ended up somewhere else. Thus, waste reduction, though a positive step in the direction of real prevention is not a comprehensive toxics prevention strategy.

Fortunately, experience has shown that many, if not most, waste reduction steps taken by industry also constitute toxics use reduction. Advocates for toxics use reduction support waste reduction but believe that the best way to reduce waste is by using toxics use reduction methods. As noted, these methods are a slightly more narrowly defined subset of all waste reduction methods.
UNIQUE BENEFITS OF TOXICS USE REDUCTION

By definition, toxics use reduction embodies a comprehensive preventive approach, which would produce several socially desirable outcomes by reducing all exposures to toxics, including:

- reducing the numbers of accidents and spills experienced in transporting and storing toxic chemicals and waste;
- reducing routine and accidental occupational exposures to toxic materials;
- reducing the amount of hazardous waste that contaminates our air, water and land, thus reducing the damage to our natural ecosystems and food chains;
- reducing reliance on costly, nonproductive pollution control systems and on the required number of hazardous waste treatment, storage and disposal facilities;
- reducing the creation of new Superfund sites that require lengthy and costly cleanups;
- reducing consumer exposures to toxics-laden products;
- reducing the amount of household hazardous waste from discarded consumer products which find their way into municipal garbage streams.

The benefits of toxics use reduction are not restricted to the environment and human health. Toxics use reduction can also result in long-term economic benefits. Simply stated, it is often cheaper not to produce toxic hazards in the first place than it is to deal with the toxics and their associated health effects after they have spread out into the environment. As the age-old adage goes, “an ounce of prevention is worth a pound of cure.” To the extent that a firm uses less toxics, it will incur fewer environmental costs. For example:

- Riker Laboratories in California is saving $15,000 annually since they replaced an organic solvent with a water-based solvent for coating medicine tablets. In addition, Riker realized a one-time savings of $180,000 in pollution control equipment that was deemed unnecessary once the switch to the water-based solvent dramatically reduced air pollution emissions. (13)
- Chevron USA is using a high-pressure, closed loop, hot water cleaning system that replaced a cleaning system that used toxic chemicals. This has resulted in a $50,000 annual savings in waste management costs. (14)
- The Borden Chemical Company installed new filter rinsing and tank cleaning procedures that reduced the discharge of organic solvents into the wastewater stream. This has resulted in an annual reduction in their disposal costs by $48,000. (15)
In light of the benefits described, why don’t more companies engage in toxics use reduction? The primary reason is that implementation of toxics use reduction would involve a fundamental restructuring of the present pollution control environmental protection system. The preoccupation with pollution ‘control’ has resulted in a low level of education and awareness about preventive strategies. In addition, companies presently do not have much of the information about their own industrial processes that they need to plan and implement toxics use reduction strategies.

Unless some government action is taken industry will not move quickly from the present mindset of pollution control. The federal government has in the past made some token attempts to set national priorities straight. For instance, in 1976, Congress passed the Toxic Substances Control Act (TSCA), granting the EPA broad powers to gather information on a wide range of chemicals, limit or ban their production and use, and require manufacturers to clearly mark their hazards. EPA has not taken this law very far in developing and implementing preventive strategies. In its first seven years, EPA issued regulations for only four substances under TSCA. (16)

In 1984, Congress made another attempt to design a national pollution prevention strategy when it declared that:

“It is to be the national policy of the United States that, wherever feasible, the generation of hazardous waste is to be reduced or eliminated as expeditiously as possible.” (17)

Unfortunately, this sweeping policy statement has never effectively been implemented. Instead, for quite some time EPA promoted the concept of “waste minimization,” and left it to the business community to define the term as they choose. Businesses have tended to consider “waste minimization” to be any reduction in RCRA-defined wastes going to landfills, and have promoted incineration as a preferred minimization method.

HOW STATES SHOULD PROMOTE TOXICS USE REDUCTION

In the absence of strong federal efforts to institute a national toxics use reduction program, it is imperative that states take the lead. We propose the following model state program to induce businesses and government agencies to take a serious look at toxics use reduction and to provide needed educational and financial tools they require to realize reductions.

The strength of the proposed program lies in its comprehensive, integrated approach. It relies on a number of closely intertwined elements which would work together to promote widespread toxics use reduction. Some elements represent “sticks,” or requirements that businesses must adhere to, and some represent “carrots,” or benefits that businesses receive. Other elements would realign and refocus government efforts to promote toxics use reduction and would expand enforcement and oversight roles for both public officials and private citizens. The elements are as follows:

1. REPORTING AND PLANNING REQUIREMENTS

Under our proposal, a state would require the largest users of toxics to report, for each production process used, the type, amount and ultimate destinations of toxic substances used. They would also be required to formulate plans for reducing the amount of toxics they use. These
requirements would induce businesses to become aware of the potential benefits of toxics use reduction methods.

2. EDUCATION, TECHNICAL AND FINANCIAL ASSISTANCE

One of the largest obstacles to toxics use reduction is a lack of awareness on how to plan for and implement use reduction techniques. To help alleviate this problem, a Toxics Use Reduction Institute would be established to: develop a much-needed clearinghouse of use reduction methodology; train and certify Toxics Use Reduction Planners who will review the required plans; conduct research; and provide technical assistance. Also under our proposal, a state program would be established to offer an extensive technical assistance program for users of toxics, to offer them working capital in the form of loans, and to promote insurance rates that reward toxics use reduction.

3. STRONGER AND MORE COORDINATED ENFORCEMENT OF LAWS

Our proposed toxics use reduction program would provide state government with a brand new focus that makes toxics use reduction a first priority in dealing with toxics use and waste generation. State agencies would initiate a “cross-media” (air, water, land, workplace) approach to regulation and set up inspection procedures that for the first time would take toxics releases into all environmental media into account. In addition, where toxics inspectors find violations, they would be required to encourage toxics use reduction as a solution.

4. PHASE-OUT OF CERTAIN TOXICS

A program would also be established to gradually phase-out the use of particularly dangerous toxic chemicals. An example is the recent international agreement to decrease the use of ozone layer-destroying chlorofluorocarbons (CFCs). This phase-out program would accomplish the twin goals of eliminating the use of dangerous chemicals while giving industry time to develop innovative substitute chemicals, processes, and products.

5. CITIZEN INVOLVEMENT

To augment the various states’ government activities, citizens, residents and workers would have access to the required chemical use data and toxics use reduction plans, except those portions for which firms have applied for and been granted trade secret status. Citizens would also be able to request public hearings to discuss use reduction plans, inspect toxics users’ facilities, petition to have substances considered for phase-outs, and sue to enforce any state’s environmental laws. Their involvement would complement government oversight. It also would encourage businesses to become better “corporate citizens” by demonstrating to their communities that their operations do not or will not present unacceptable short-term or long-term hazards. Such citizen empowerment would serve to “democratize” the use of toxics, since workers and people in communities, as well as consumers, would have more influence over corporate decisions that affect their health and well-being.

6. TOXICS USE TAX

In order to ensure ongoing financing for a statewide toxics use reduction program, a small tax would be levied on the first sale or use of toxics in the state. The rate of taxation for a substance will depend upon its relative toxicity.
The time has come to stop accepting the ever-increasing use of toxic chemicals by industry across America. We need to break out of the constraints of the pollution control mindset and move forward into a post-chemical age of clean and efficient technologies. To continue on the present course is to invite not only environmental, but also economic disaster. As Michael Royston pointed out in his book, *Making Pollution Prevention Pay*, the words “ecology” and “economy” are both derived from the same ancient Greek root, oikos; the former means “to study our house,” while the latter means “to manage our house.” (18) Toxics use reduction is the means by which we can act positively to combine economics with ecology, thus moving a few steps closer to achieving a truly stable, healthy society.
FOOTNOTES


7. OTA, Serious Reduction of Hazardous Waste, p. 82

8. Ibid., p. 83.

9. Ibid., p. 80

10. Ibid., p. 81

11. Ibid., p. 9


WHAT IS PIRG TOXICS ACTION?

PIRG Toxics Action is a national resource and technical assistance center established by state Public Interest Research Groups (PIRGs) to promote effective solutions to pollution problems. As a national project, PIRG Toxics Action assists state PIRGs and other state and local activists with policy guidance, development of educational materials, and assistance in doing research projects. In addition, our researchers work to document the many facets of toxics problems, using federal databases and other sources to produce national and state reports. The PIRG Toxics Action staff also assist in production of audio/visual resources, development of organizing strategies and outreach to the media.

PIRG Toxics Action is dedicated to fundamentally solving the toxics problem that faces us today. To do this we need to attack the problem from many fronts. These are represented in our comprehensive 5-Point Platform. The platform consists of the following:

1. Motivate industry to reduce the amount of toxics they use and waste they produce.
2. Locate, contain and permanently clean up toxic waste dumps.
3. Regulate the treatment and disposal of hazardous materials and impose strong criminal and financial penalties for illegal polluters.
4. Compensate the victims of toxics exposure in the workplace and in communities.
5. Strengthen citizen’s “Right-to-Know” about potential hazards that toxics pose to community residents and workers.

State and local governments often take the lead in developing and promoting solutions to pollution problems prompting more widespread federal action. PIRG Toxics Action assists state PIRGs and other local, state and national environmental activists to further enhance this trend of state action. In turn, we work with U.S. PIRG, the state PIRGs’ national office, to help ensure that state and local action translates to federal action.

We firmly believe that practical and effective solutions exist for most of our pressing toxics problems. PIRG Toxics Action is working to solve not only those problems existing from decades of rampant toxics use and waste, but also to prevent future problems as well.

Affiliates: California PIRG, Colorado PIRG, Connecticut PIRG, Florida PIRG, Illinois PIRG, Maryland PIRG, Massachusetts PIRG, PIRG in Michigan, Missouri PIRG, New Jersey PIRG, Ohio PIRG, Oregon State PIRG, Pennsylvania PIRG, Washington PIRG, West Virginia PIRG

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