

Toxics Use Reduction: The Critical Issues

Manik Roy and Hillel Gray

Inspired by the progress that state-led initiatives have achieved in promoting toxics use reduction (TUR), lawmakers have proposed TUR legislation in Congress. Several bills that are part of the proposed amendments to the federal Resource Conservation and Recovery Act (RCRA) focus on expanding reporting requirements under Section 313 of the 1986 Superfund Amendments and Reauthorization Act, facility planning requirements, and public access to information on chemical use and technical assistance for firms that are committed to reducing the use of toxic chemicals.

TOXICS USE REDUCTION (TUR)—a pollution prevention concept that has been gaining momentum at the state level for several years—has emerged, with strong support in Congress, as part of proposed amendments to the Resource Conservation and Recovery Act. These amendments would establish practices that “reduce the use and production of such substances without creating new risks to communities, workers, consumers, or the environment” and are “the most favored method[s] to prevent problems associated with hazardous wastes, and to protect public health and the environment from hazardous or toxic substances.”

The “Community Right-To-Know More” bill (H. R. 2880, introduced by Representative Gerry Sikorski (D-MN)) is one of the key pieces of legislation promoting the drive to incorporate TUR into federal laws. In the Senate, environmentalists are supporting a package that includes the “Right-to-Know-More” Act, (S.2123), introduced by Senator Frank Lautenberg (D-NJ) and Senator David Durenberger (R-MN), and the Hazardous Pollution Prevention Planning Act (S.761), introduced by Senator Joseph Lieberman (D-CT).

The Sikorski bill, which had 151 cosponsors as of early February 1992, would, among other things, expand manufacturing firms’ reporting requirements under the Toxics Release Inventory (TRI, from Section 313 of the Superfund Amendments and Reauthorization Act of 1986) to other industry sectors and chemicals, require that facilities disclose information on toxic chemical use, and require that facilities develop toxics use reduction plans. This article discusses the central issues for industry and the public at large that are raised by these bills and the broader movement to firmly establish toxics use reduction as an essential component of industry’s environmental protection objectives.

Toxics Use Reduction versus End-of-Pipe Pollution Control

Several states have been leading the nation in developing toxics use reduction laws and regulations. Maine, Massachusetts, New Jersey, Oregon, Vermont, and Washington all have state laws that

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What Is Toxics Use Reduction?

Toxics use reduction is the practice of changing products and productive activities to reduce the use of toxic chemicals and cut toxic wastes prior to recycling or treatment. The goal of toxics use reduction is to reduce the harm, or potential harm, to human health and environment due to the manufacture, transportation, use, consumption, and release of the toxic materials, without creating new hazards for workers, consumers, and the environment.

The actual techniques by which a firm can reduce its use of toxic materials can include:

- Substituting nontoxic or less toxic substances for toxic chemicals—e.g., replacing solvent-based coatings with less toxic, water-based coatings;
- Reformulating or redesigning products—e.g., formulating paint without lead;
- Changing production processes—e.g., reducing pressure in high-pressure lines to reduce fugitive emissions of air toxics;
- Improving housekeeping—e.g., ensuring that standard operating procedures minimize spills and include preventive maintenance; and
- Extended use, reuse, and recycling in a process—e.g., reusing the metals in a rinse bath by circulating the rinse back into a plating tank.

Toxics use reduction does *not* include:

- Recycling on-site if the recycling is not integral to and necessary for the production process;
- Recycling off-site;
- Shifting release of toxic materials from one medium of disposal to another medium, to the workplace, or into consumer products;
- Improving methods of waste treatment or waste recycling—e.g., using fewer chemicals during waste treatment; or
- Any form of combustion or incineration; or waste stream segregation.

Note that toxics use reduction—which addresses *all* risks associated with toxic chemicals—is inclusive of and more comprehensive than “source reduction,” which is often understood to refer only to risks posed by the toxic chemicals in a firm’s by-products and wastes.

require facility planning and reporting as a means of promoting toxics use reduction, and state laws in Arizona, California, Connecticut, Indiana, and Iowa also promote use reduction. (See *Pollution*

Prevention Review, Winter 1991-92, for a detailed analysis of the New Jersey TUR Act.) Legislation for toxics use reduction is emerging or pending in many other states, including Colorado, Florida, Ohio, Pennsylvania, South Carolina, and Tennessee. (Note that the specifics of both the laws and their implementation vary widely, as one would expect from a state-led effort.)

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This article discusses four major reasons for shifting the focus of environmental legislation from end-of-pipe pollution control to toxics use reduction. First, pollution controls do not address several key problems associated with toxics use, most notably workplace hazards, consumer exposure to and disposal of toxic products, and accidents involving toxic feedstocks. For example, there are more than 6,500 chemical accidents annually during transport, storage, and processing—and only a fraction involve hazardous waste. In fact, the dangers posed by these use-related hazards may very well exceed the end-of-pipe emissions risks.¹ Similarly, increased hazardous waste recycling could exacerbate the threat of chemical accidents and occupational risks.

Second, toxics use reduction is fundamentally more protective of human health and the environment than recycling, treatment, and release. Such pollution controls often bring new toxic hazards to a facility, such as wastewater treatment chemicals. Furthermore, media-specific pollution controls often shift toxics into another medium, such as sludge or incinerator ash. This “toxic shell game” may also be repeated by focusing exclusively on waste reduction, to the extent that toxic wastes are transferred back into the workplace and into consumer products. Moreover, pollution control technologies have serious technical limitations, especially in coping with carcinogens and persistent toxics that have been labeled “safe” or “acceptable” for political reasons, but may, in fact, not be safe.

Third, industries that install end-of-pipe controls in order to comply with EPA’s end-of-pipe performance standards do not need to be innovative or fully protective of the environment, its workers, neighbors, or customers. EPA bases most environmental standards on existing, economically acceptable treatment technology to avoid economic dislocation, and because there is so much uncertainty in our understanding of human health and environmental risks. Furthermore, EPA bases standards on end-of-pipe control technologies because of the tremendous variety of production methods that can be used, even within single industry sectors.

Although a company may comply with such EPA standards using either TUR or existing end-of-pipe technologies, many use only the latter, leaving important cost-effective toxic use reduction opportunities untouched. In other words, industry is not being required by current EPA standards to protect the environment to the fullest extent that is technologically and economically feasible.

Fourth, toxics use reduction is fundamentally different from recycling and treatment, because an industrial firm choosing toxics

use reduction strategies must consider quite different issues than those involved in end-of-pipe recycling and treatment. Indeed, toxics use reduction opportunities are often ignored by industry because they may require changes to a firm's production process that also involve important adjustments to business strategy. For example, toxics use reduction decisions are intertwined with product quality reliability of the production line, choice of input materials, and worker training, none of which are usually important in developing end-of-pipe control approaches.

Thus, industrial firms have historically chosen to insulate production decisions from environmental protection requirements by relying on end-of-pipe control approaches. As a result, firms have often passed up more cost-effective toxics use reduction measures.² Though this seems to be changing in the operations of certain industry leaders, most companies still have a long way to go toward removing the internal barriers between the typical firm's production and environmental decisions. (In fact, the frequent industry request that out-of-process recycling and even treatment be considered "pollution prevention" is an example of the continuing end-of-pipe bias.)

The Right-to-Know Approach to Promoting Toxics Use Reduction

The reporting and planning provisions included in the Sikorski bill are a distinct departure from the typical "command and control" approach in which EPA would be directed to set toxics use reduction performance standards for all industry.³ The approach is anchored on public access to information about industrial toxic material use, building on the lessons of the Toxic Release Inventory.⁴

TRI has proven extremely effective as a means of providing important information to the public. It has also shown that public scrutiny motivates industrial behavior in a way that the performance standards approach alone may not. Public scrutiny will likely play a similarly constructive role in motivating toxics use reduction.

Because risk to human health and environment comes not only from toxic releases, but from all aspects of toxic material use, the right to know is just as important for use as it is for release. By the same token, the public is as likely to take advantage of use information as effectively as it has with the release information.

Despite industry fears during its passage in 1986, the TRI provisions are now almost universally praised for raising the level of public discussion over the industrial release of toxic chemicals. Industry representatives frequently tout the motivational value of TRI and have apparently been surprised to find that the public is more sophisticated and willing to consider the complexities of industrial toxics release issues than originally thought in 1986.

Providing the public with toxic material use information should motivate industrial initiatives to reduce toxic material use, just as providing release information motivates industrial initiatives to reduce

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releases. As with TRI, the public reporting of information on toxics use will likely raise the awareness of CEOs, plant managers, and production managers—who are essential to a firm's success in promoting and practicing toxics use reduction.

Most importantly, public debate may be necessary to address issues that might not be readily resolved in the regulatory arena. Rather than relying solely on the command-and-control process, environmentalists are arguing that companies should be called on to analyze their own processes, identify their own toxic use reduction opportunities, set their own reduction goals, and be accountable to the public.

Industry Success with Toxics Use Reduction

In addition to participating in the crafting of much of this legislation, many companies have been pursuing toxics use reduction for years. For example:

Intertox America, New Jersey—This paper-processing company developed a method for bleaching paper using hydrogen peroxide and now operates as a consultant to other paper processors, helping them to switch to the new process and eliminate their use of toxic chlorine bleaching agents.

Cleo Wrap, Tennessee—The world's largest producer of gift wrapping converted from using organic solvents to using water-based printing inks throughout all of its operations. Organic solvent-based inks required organic solvents for cleaning processes. The change allowed the company to use water-based cleaning solvents.

Riker Laboratories, California—When this pharmaceutical plant coated medicine tablets with organic solvents, they were at risk of exceeding California's air pollution limits. Riker switched to a water-based solvent and reduced the production of air pollution by twenty-four tons annually. In addition, \$180,000 in pollution control equipment was deemed unnecessary, and now Riker saves an additional \$15,000 in solvent costs annually.

Elkhart Products, Indiana—Modifying the equipment operation allowed this pipe-fitting manufacturer to remove cyanide and chromic acid from the cleaning process. This process redesign also allows the recovery of over 1,000 pounds of copper for reuse a month.

Hill Air Force Base, Utah—An alternative technology for stripping paint removes paint with conventional sandblasting equipment modified to use recoverable plastic beads. Thousands of gallons of contaminated water and the use of a toxic cleaning solvent are avoided.

Emerson Electric, North Carolina—Worker exposure to organic

paint solvents was eliminated when this power tool manufacturer converted from an organic solvent-based system to a water-based system. This change allows 99.5 percent recovery and reuse of the paint, saving \$600,000 a year.

In general, toxics use reduction may save industry money. There is a growing body of anecdotal literature on companies that have saved money by practicing toxics use reduction, primarily by avoiding raw material and waste handling costs. In addition, there may be even greater economic benefits to systematic toxics use reduction planning. The planning used to identify toxics use reduction opportunities includes establishing goals, measuring progress toward those goals, and analyzing production processes to identify efficiencies. These are similar to the tools used in the application of Total Quality Management (TQM) to the objective of protecting human health and the environment. In short, if industry is not systemically considering toxics use reduction opportunities, it is probably not protecting the environment by the most cost-effective means possible.

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TUR and Small Businesses

The vast majority of small businesses do not use enough toxic chemicals to be subject to TUR reporting requirements. Those that do would get technical assistance to identify their toxics use reduction opportunities. (One of the provisions of the Sikorski bill is to expand EPA's technical assistance programs for toxics use reduction.)

Most small businesses are also exempt from the reporting and planning requirements either because they are below the chemical use thresholds (for example, a firm that does not use or release more than a certain amount of a given chemical is exempt), or because they have fewer than ten employees. In addition, technical assistance programs would be targeted to include small businesses. Such targeting recognizes that a small business that handles large amounts of toxic materials may lack important expertise, and may, in fact, have more impact on the environment than a larger firm.

Trade Secrets

Certain industry groups are particularly concerned about the implications of toxics use reporting for trade secret protection. Trade secrets can and should be protected by provisions that specifically address those cases in which trade secrets are a genuine concern.

The state of New Jersey has collected use data on a facility-wide basis for three years as part of their right-to-know program and has only three trade secret claims to date. In the first year of reporting under the Massachusetts Toxics Use Reduction Act, which requires both facility-wide and process-level-specific reporting on toxic chemical production use, there were only six trade secret claims out of 600 reports. (Process level reporting will be required as well under the 1991 New Jersey Pollution Prevention Act.)

Industry's trade secrets can be protected under toxic chemical use reporting laws by including trade secrets protection provisions and requiring that some use data be reported in ranges rather than absolute numbers. Both are used in the TUR bills supported by environmentalists.

The Production Unit: A Key to Shifting the Focus Upstream

One of the most important details of the TUR bills being considered by Congress directs attention to "production units." A production unit is the collection of activities and equipment that produce a product or family of products. (A production unit may also be the collection of activities and equipment used to provide a service. A production unit does not include waste recycling or treatment operations.)

Most facilities manufacture several types of products or provide several types of services. For example, a company may use the same solvent in painting one product that it uses to clean a completely different product. Environmentalists argue that the reporting and planning requirements should be organized around production units. Without distinguishing between individual production units, it would be impossible for the firm or the public to track toxics use reduction progress at a facility and account for fluctuations in production activity at any facility making more than one type of product.⁵ Using the example given above, the company—and its interested public—could track progress in reducing the use of solvent in its two production units only by tracking them separately.

In addition to its importance in measuring progress, the focus on production units is essential for redirecting corporate attention to the products and processes that comprise the actual sources of toxics use. Also, "specific data on production units must be used if meaningful waste reduction statistics are desired at a national level."⁶ Finally, production unit data make it possible to pinpoint toxics-intensive products to help set priorities for technical assistance, research, and other agency support.

Conclusion

For twenty years, our society has attempted to curb the multiple hazards associated with industrial toxic chemicals. Increasingly, enforceable limits are being placed on occupational exposure, air emissions, and water pollution. Some products have been labeled or restricted, some waste sites cleaned up, some accidents contained or mitigated quickly. As human and environmental toxic exposures keep mounting, there is a need to adopt and rigorously enforce much more protective "end-of-pipe" standards and liabilities.

At the same time, we cannot ignore the inherent shortcomings of waste treatment and pollution control technologies. Industrial innovations are needed to prevent toxic hazards in the first place and to enable businesses to economically meet—and exceed—tighter standards.

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The proposed "Community Right-to-Know More" Act would give citizens, media, government, and CEOs the data necessary to evaluate industrial toxics use and prevention. It would require engineers, scientists, and product designers to answer new questions and set new goals for reducing such use. It would reorient attention toward products and industrial processes, away from waste recycling or treatment. Furthermore, the Right-to-Know approach to toxics use reduction would take advantage of corporate sensitivity to public opinion as a way to shift the debate from a "wastes" preoccupation to a new paradigm designed to reduce and prevent the initial uses of toxic chemicals. ♦

Notes

1. Ryan, Lomax, and Osten, "Toxic Truth and Consequences: the Magnitude of and the Problems Resulting from America's Use of Toxic Chemicals," National Environmental Law Center and U.S. PIRG, 1991.
2. For more information on the cultural aspects of this separation, see Manik Roy, "Pollution Prevention, Organizational Culture, and Social Learning," *Environmental Law*, Northwestern School of Law of Lewis and Clark College, Vol. 22, No. 1, 1992.
3. Note that while H.R. 2880 would not mandate that EPA establish performance standards, it would give EPA authority to do so.
4. Reporting and planning are only two of a larger set of environmental measures. Other important aspects of the toxics use reduction approach are not discussed here.
5. "[Normalizing] ratios becomes less meaningful as waste data are aggregated from various production units within one facility The Office of Technical Assistance (1986) also concluded that waste reduction data should be process-specific or production-unit-specific, because facility-level reporting would be too complex to obtain meaningful data." From "Tracking Toxic Substances at Industrial Facilities," National Research Council, Committee to Evaluate Mass Balance Information for Facilities Handling Toxic Substances, Washington, DC, 1990, p.48.
6. Ibid. p. 54.