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Toxics Use Reduction Institute, US

The Toxics Use Reduction Institute researches, tests and promotes alternatives to toxic chemicals used in Massachusetts industries and communities.

Origins

In the late 1980s, two opposing sides in Massachusetts were arguing over what to do about the use and release of toxic chemicals. A coalition of environmental groups wanted to see certain chemicals restricted or banned, while a business coalition wanted to ensure legislation would not cause businesses to leave the state in search of more relaxed rules elsewhere.

In 1989, the Massachusetts Legislature encouraged the two sides to talk and make concessions. As a result, the ground-breaking Toxics Use Reduction Act (TURA) was passed. This Act seeks to promote safer and cleaner production, while enhancing the economic viability of Massachusetts firms. Toxics use reduction focuses on the use of toxics and the generation of wastes in the manufacturing process, rather than the normal regulatory approach of controlling wastes once produced.

Aims and objectives

The Toxics Use Reduction Institute (TURI) was established by the 1989 Act as a state agency housed at the University of Massachusetts Lowell with the purpose of: researching, testing and promoting alternatives to toxic chemicals used in Massachusetts; providing the tools and resources which could help local businesses and communities to reduce their use of toxic chemicals while making Massachusetts a safer place to work and live; and promoting greater efficiency and competitiveness.

The Act set a state-wide goal of reducing the toxic waste generated by 50% by the year 1997. It established toxics use reduction as the preferred means of achieving compliance with other federal and state legislation. The Act also establishes the public's right to know by means of the annual Toxics Use Reduction Information Release, which TURI places on the Internet, allowing communities to find out what's being used and what's being released locally.

Under the Act, every business in Massachusetts which manufactures or processes more than 25,000 lbs, or otherwise uses more than 10,000 lbs a year of certain listed toxic substances, is required to prepare a detailed Toxics Use Reduction Plan. In the Plan, they must examine how and why toxic chemicals are used at their facility, evaluate their options, and produce two- and five-year goals for the reduction of the chemical by-products from each listed chemical.

The plan has to include information about the technical feasibility of implementing various chemical reduction techniques, the economic impacts of each technique, and a schedule for implementation. Businesses are also required to report annually on the quantities they use, generate as waste, and ship as a product, and to pay a toxics use fee. Each plan has to be passed by a certified Toxics Use Reduction Planner. In 1989, these conditions applied to around 700 industrial facilities.

The Act set up two agencies to help businesses understand the science and practice of toxics use reduction - the Office of Technical Assistance, to provide direct on-site assistance to businesses, and TURI.

The benefits of all this to Massachusetts are considerable. Firstly, less toxics use means less risk of pollution, reduced handling and reduced worker exposure. Secondly, by reducing their use of toxics, firms benefit from reduced operating and purchasing costs, reduced hazardous waste storage and disposal costs, and increased efficiencies. Thirdly, less toxics use generally means less stringent permits and paperwork. And fourthly, toxics use reduction helps to reduce long-term public health and environmental risks, which carry a significant healthcare cost.

Toxics use reduction describes a range of environmental protection strategies aimed at minimising the input of toxic materials into an industrial process, and the generation of harmful by-products. This includes several strategies, such as:

- Replacing toxic materials with non-toxic alternatives.
- Altering a production process to reduce the need for toxic inputs.
- Replacing or upgrading older, less efficient machinery and processes.
- Using good housekeeping practices to avoid pollution risks.
- Using filtration and other closed loop methods to get more mileage out of toxic materials before they must be disposed of or discharged.

Activities

TURI's staff are engaged in five major areas:

Firstly, they work with industry, holding working meetings with businesses that form part of the supply chain of a product, and establishing peer networks and online forums which help firms

learn about each other's best practices and emerging global trends which impact on their businesses. They inform industry of the latest cleaner technologies and materials, and sponsor university research to develop solutions where none currently exist.

Secondly, they provide training for toxics use reduction professionals, civic and community groups, vocational students, and government agency staff, creating better understanding about toxic chemicals, chemical use substitution, pesticide reduction and specific technologies such as lead-free electronics.

Thirdly, they operate a library and information clearing house related to toxics use reduction, including a free biweekly e-mail service (the 'Greenlist Bulletin') which summarises the latest reports and papers.

Fourthly, they operate a laboratory service that provides performance testing for safer cleaning alternatives for specific applications.

Finally, TURI provides Toxics Use Reduction Networking (TURN) grants for community groups, and offers training in toxics use reduction to Massachusetts communities and municipalities, to encourage collaborative action, and develop model projects and materials that other communities can copy.

Among the community grants awarded in 2005 are: one to the Healthy Boston Schools Janitorial Project to reduce the use of toxic cleaning chemicals; one to the Vietnamese Healthy Nail Salon Initiative to evaluate and promote safer products; and one to the Model Cosmetology Salon Project, to incorporate toxics use reduction into the curriculum and design of a new vocational school. Other grants have gone to a project to identify and reduce long-term pesticide exposure in humans and wildlife, to an initiative to develop a toxic use reduction training manual for workers and labour unions, and to a community partnership developing a toxics use reduction education programme.

Structure

TURI is part of a partnership which implements the Toxics Use Reduction Act, in conjunction with an appointed seven-member Administrative Council on Toxics Use Reduction, the Department of Environmental Protection (which gathers the Reduction Plans and reports from the major users) and the Office of Technical Assistance (which provides confidential engineering and scientific advice to businesses).

Finance

TURI is a Massachusetts state-funded agency. Its current annual budget from the state is $1.2 million, which is financed from the toxics use fees collected under the Act.

Performance

The performance of TURI and the TURA can be measured in four ways: as a reduction in the total amount of toxic substances used; as a financial benefit to the businesses involved; as a benefit to the Massachusetts economy; and as a benefit to people's health and the environment. Overall, the Act has been an outstanding success. The goal of a 50% reduction in toxic by-product generation was met in 1998, and industry has continued to reduce its use of toxics since then. From 1990 to 2002, after the data was adjusted for a 22% increase in production, the Core Group of industries (representing about 50% of the total toxics use) had reduced:

- Toxic chemical use by 42%.
- Toxic by-products by 67%.
- Toxics shipped in product by 58%.
- Toxic releases to the environment by 92%.
- Toxic transfers offsite for further waste management by 54%.

Since 1990, over 1,000 Massachusetts firms have participated in the programme, and around 450 no longer produce enough toxics to meet the thresholds for participation.

On the business level, a 1997 evaluation of 434 businesses showed that 67% of the firms implementing toxics use reduction reported a cumulative direct cost saving of $14 million in the period 1990-97, as well as health, environmental and other benefits.

As an example Poly-Plating Inc, which produces nickel-plated parts for industry, involved its employees in redesigning its nickel-plating methods. The business reduced acid use by 96%, acid waste disposal costs by 91%, and water use and sewage fees by 98%, for a total annual saving of $107,000, and a payback period for the investment of 25 months.

For Massachusetts as a whole, TURA is helping industries compete more strongly in the global market, since the Act is helping them to meet the new standards for toxics reduction required by the EU and by Japanese manufacturers. TURI's Wire and Cable Supply Chain Initiative, for instance, will enable local manufacturers to develop lead-free wire and cable that will meet the EU and Japan's strict new requirements.

On the health and environmental front, the overall reduction in chemical use and emissions is of clear benefit to humans, wildlife and the environment. Within this overall reduction, while the amount of carcinogenic chemicals being used fell by 5% between 1994 and 1998, the amount being released into the environment fell by 77%.

Future

Since 1997, TURI has shifted to an emphasis on the more hazardous chemicals. In 2002, the agencies initiated a High Priority Substances programme and chose five chemicals to focus more resources on: lead, mercury, arsenic, trichloroethylene and dioxin. TURI has focused heavily on lead and TCE reduction. The lead elimination is being driven by the EU's directives on Waste from Electrical and Electronic Equipment, and Restriction of Hazardous Substances. For several years TURI had been facilitating the identification and testing of alternative materials with the supply chains impacted by these directives.

For further information contact:

Liz Harriman, Deputy Director
Toxics Use Reduction Institute
University of Massachusetts Lowell
One University Avenue
Lowell, Massachusetts 01854-2866
United States
Tel: +1 978 934 3346
E-mail: harriman@turi.org
Web: www.turi.org

Written by Guy Dauncey, Sustainable Communities Consultancy, Victoria, BC, Canada (guydauncey@earthfuture.com)