The Massachusetts Toxics Use Reduction Act (TURA): Overview and Lessons Learned

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April 13, 2017

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Designing Policies to Support Innovation in Safer Chemistry and Waste Reduction – sticks and carrots

- Core Elements
  - Willingness
    - Restrictions, information requirements, planning requirements, purchasing policies, recognition
  - Capacity
    - Technical assistance, information requirements, R&D support, Education
  - Opportunity
    - Education, tax incentives, grants

- *Ashford, Nicholas. 1999. An innovation-based strategy for a sustainable environment. In Innovation-Oriented Environmental Regulation: Theoretical Approach and Empirical Analysis. Potsdam, Germany: European Commission Joint Research Centre.*

Massachusetts
Toxics Use Reduction Act (TURA)

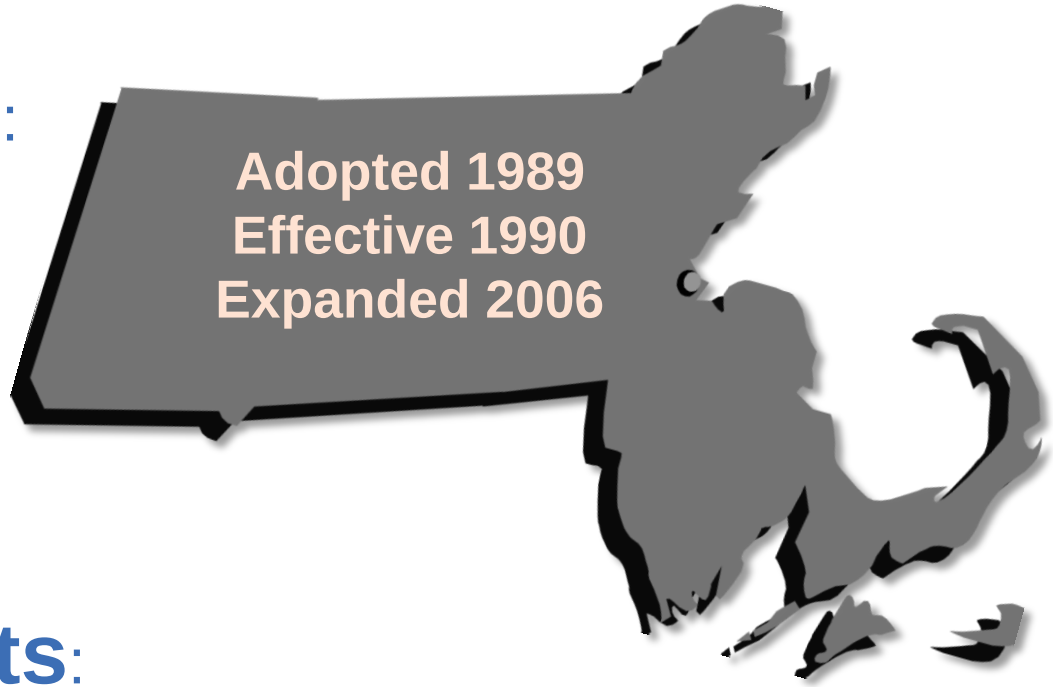
- Helps Massachusetts companies and communities:
  - ***Reduce the use of toxic chemicals*** while promoting competitive advantage of Massachusetts businesses.

Massachusetts TURA

- Sustain and promote the competitive position of Massachusetts industry
- Promote reduction in the use of toxic and hazardous substances
- Require businesses to analyze their use of chemicals, to look for opportunities to reduce toxics use and waste.
  - TUR Options Assessment
- Publicly report their toxic chemical use

Toxics Use Reduction Act

- **Companies must**:
  - ***Report*** **toxics use**
  - ***Pay*** **fees**
  - ***Plan*** **toxics reduction**



- **2006 Amendments**:
  - Designation of **higher** and **lower hazard substances**
  - **Resource Conservation Planning** – energy, water, materials
  - Integrates **Environmental Management Systems** into TUR

Progress

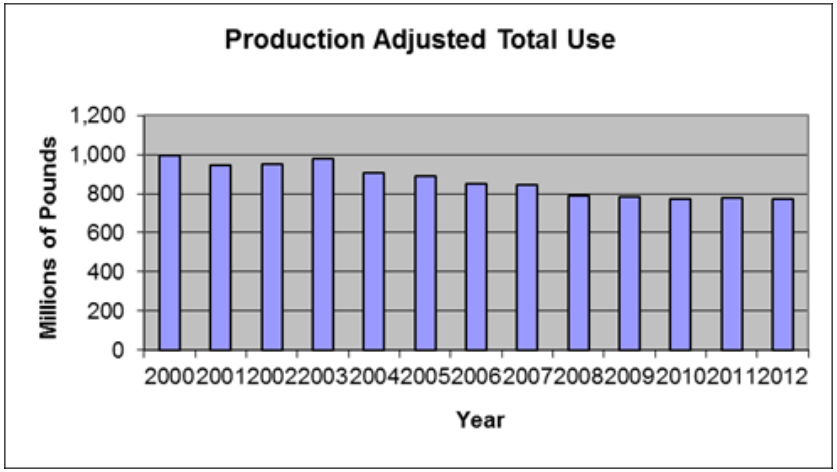
First decade
1990-2000

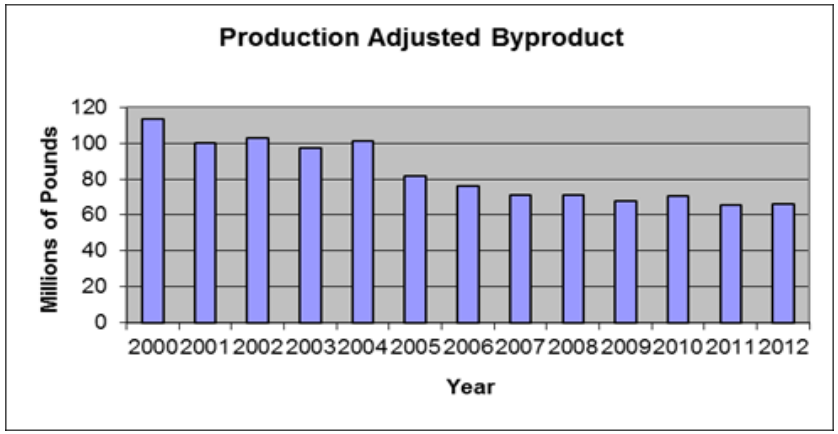
Use: 40%
Byproduct: 58%
Releases: 90%
Shipped in Product: 47%

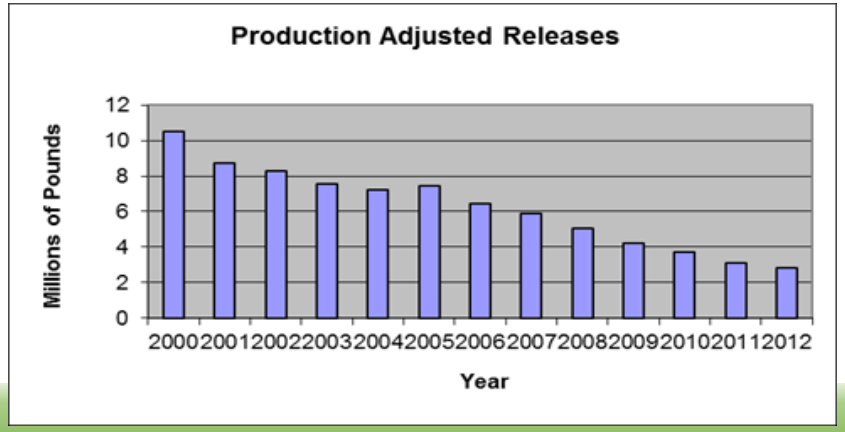
Is TURA Still working?
2000-2012

Use: 23%
Byproduct: 42%
Releases: 73%

TURA Progress 2000-2012

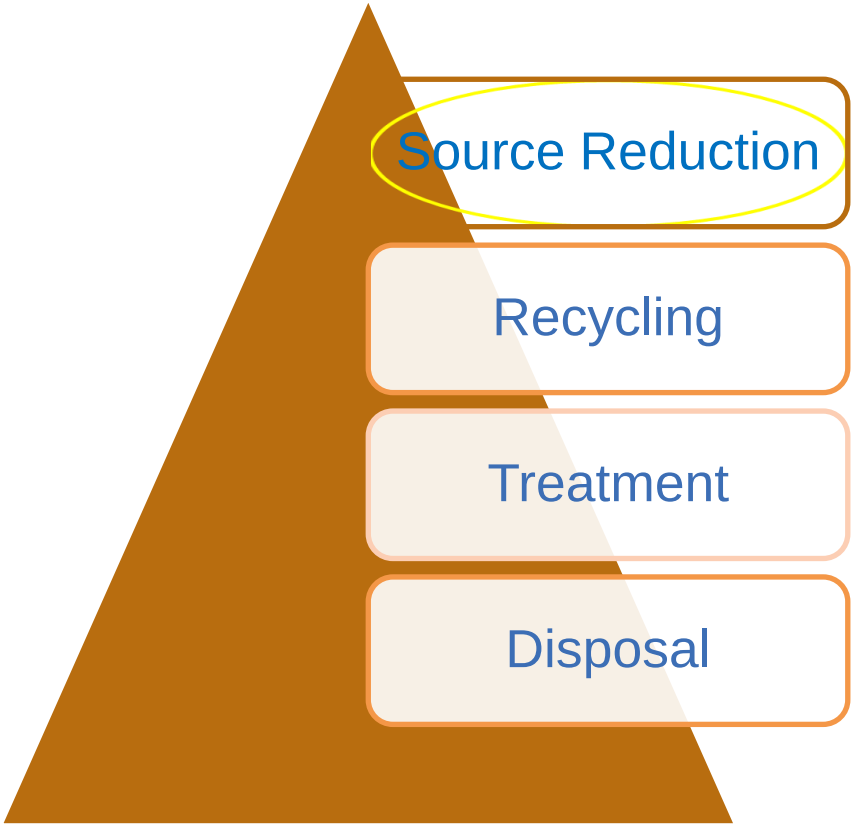






Core principles of Toxics Use Reduction

- Focus on Use
- Focus on Inherent Hazard
  - Understand the difference between “hazard” and “risk”
  - Look for opportunities to eliminate or reduce hazard.
- Primary prevention of disease



TURA Structure: Implementing Agencies

Massachusetts Department of Environmental Protection (MassDEP): planner certification, filings, enforcement, data analysis

Massachusetts Office of Technical Assistance and Technology (OTA): On-site, confidential technical assistance

Massachusetts Toxics Use Reduction Institute (TURI): Training, Grants, Research, Alternatives Assessment, Policy Analysis, Technical Support, Laboratory, Library

Toxics Use Reduction Institute

- Information on toxic chemicals and safer alternatives, international chemical restrictions
- Education and training for TUR Planners
- Supply Chain Workgroups
  - Electronics, Wire and Cable, Aerospace
    - Lead, brominated flame retardants, hexavalent chromium
- Research and demonstration of green chemistry and innovative technologies
- Grants for community groups, small businesses and NGO's
- Laboratory testing for surface cleaning
- Science and Policy

Office of Technical Assistance

MassDEP

Education & Training

- Toxics Use Reduction Planners
  - Planners' training course
  - Continuing education conferences

Business Grants Program

- FY16 Small Business Grants
  - Cleaners, sanitizers and disinfectants used in child care centers
    - Rainbow Bears Child Care Center and WORD Inc. Child Development Center, Fall River
  - Caustic sodium hydroxide and acids used for cleaning in breweries
    - Merrimack Ales, Lowell
  - Lead, solvents, acids used in auto body & repair
    - Mike's Auto Body, Fall River
- Apply for Industry Incentive Grants

Community Grants Program

- FY16 grants:
  - Gymnasiums – flame retardants
  - Early childhood education – flame retardants, phthalates, & other exposures
  - Personal care products for teens
  - Safer sanitizers for food service
  - Pesticide reduction in lawn care

University Research

- Safer oligosaccharide-based surfactants as an alternative to octylphenol ethoxylates
  - Partnership with Siemens
- Lower toxicity solvents for contact adhesives
  - Partnership with ITW Polymers Sealants
- Safer alternatives to methylene chloride for paint stripping (through TURI lab)
  - Partnership with Savogran

TURI Laboratory

- Assists industry and communities in the search for safer cleaning processes
  - Tests the performance of alternatives to hazardous solvents
  - Extensive database of results
- Industrial parts cleaning
- Janitorial cleaning

TURI Library

- Extensive collection of materials on chemicals & safer alternatives
- Greenlist – biweekly sampling of new publications of interest
- Research assistance
- Subject guides
- Research databases

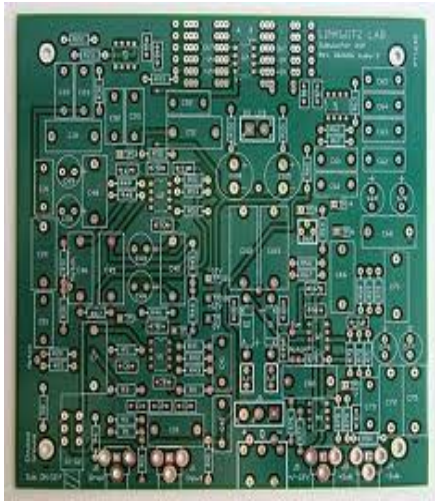
Supply Chain Work Groups & Peer Mentoring

Lead-free Electronics Consortium
- Collaborative performance testing

Wire & Cable Work Group
- Reducing use of phthalates, heavy metals

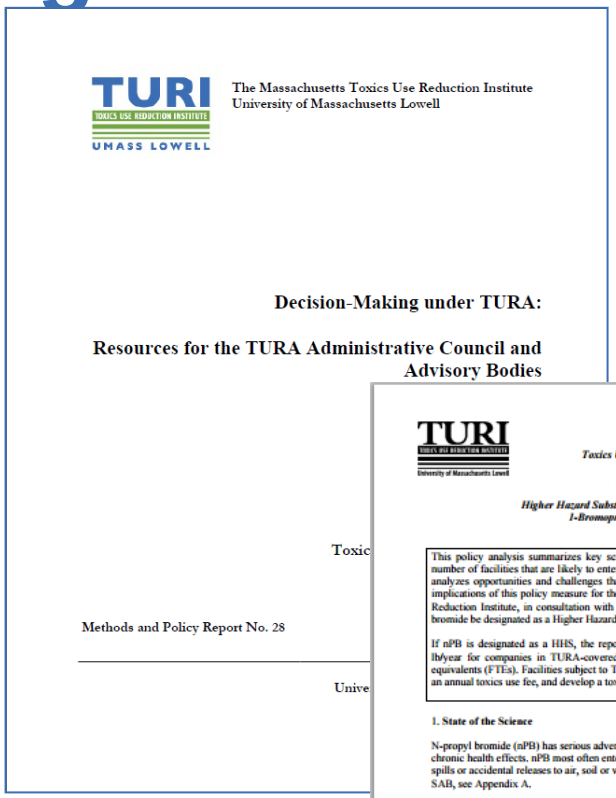
Military & Aerospace Work Group
- Addressing barriers to replacing hexavalent chromium and halogenated solvents

Industry Peer Mentoring Work Group
- Hosted by Siemens; 6 other companies currently participating



Policy Analysis, Work with Boards & Committees, Program Assessment

- Science Advisory Board
- Administrative Council & Advisory Committee
- Analysis of state & federal policy initiatives
- Assessments of TURA program results



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Decision-Making under TURA:

Resources for the TURA Administrative Council and Advisory Bodies

Toxic

Methods and Policy Report No. 28

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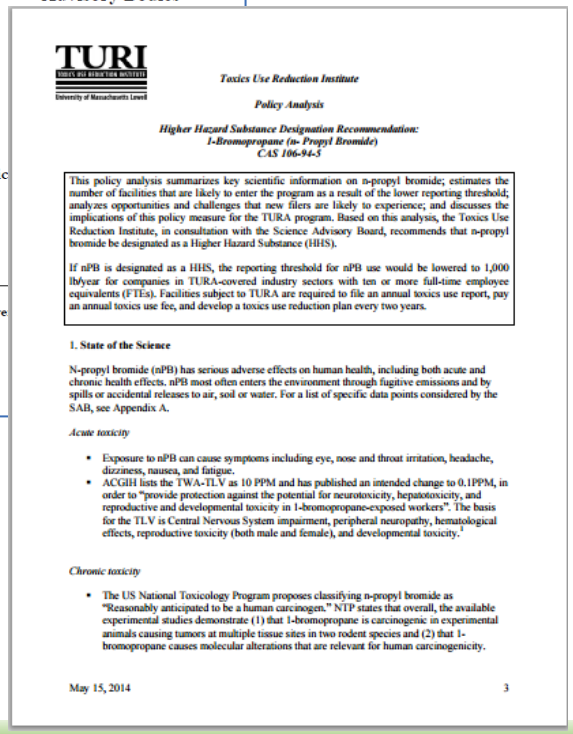

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Policy Analysis

Higher Hazard Substance Designation Recommendation:
1-Bromopropane (n- Propyl Bromide)
CAS 106-94-5

This policy analysis summarizes key scientific information on n-propyl bromide; estimates the number of facilities that are likely to enter the program as a result of the lower reporting threshold; analyzes opportunities and challenges that new filers are likely to experience; and discusses the implications of this policy measure for the TURA program. Based on this analysis, the Toxics Use Reduction Institute, in consultation with the Science Advisory Board, recommends that n-propyl bromide be designated as a Higher Hazard Substance (HHS).

If nPB is designated as a HHS, the reporting threshold for nPB use would be lowered to 1,000 lb/year for companies in TURA-covered industry sectors with ten or more full-time employee equivalents (FTEs). Facilities subject to TURA are required to file an annual toxics use report, pay an annual toxics use fee, and develop a toxics use reduction plan every two years.

1. State of the Science

N-propyl bromide (nPB) has serious adverse effects on human health, including both acute and chronic health effects. nPB most often enters the environment through fugitive emissions and by spills or accidental releases to air, soil or water. For a list of specific data points considered by the SAB, see Appendix A.

Acute toxicity

- Exposure to nPB can cause symptoms including eye, nose and throat irritation, headache, dizziness, nausea, and fatigue.
- ACGIH lists the TWA-TLV as 10 PPM and has published an intended change to 0.1PPM, in order to "provide protection against the potential for neurotoxicity, hepatotoxicity, and reproductive and developmental toxicity in 1-bromopropane-exposed workers". The basis for the TLV is Central Nervous System impairment, peripheral neuropathy, hematological effects, reproductive toxicity (both male and female), and developmental toxicity.[1]

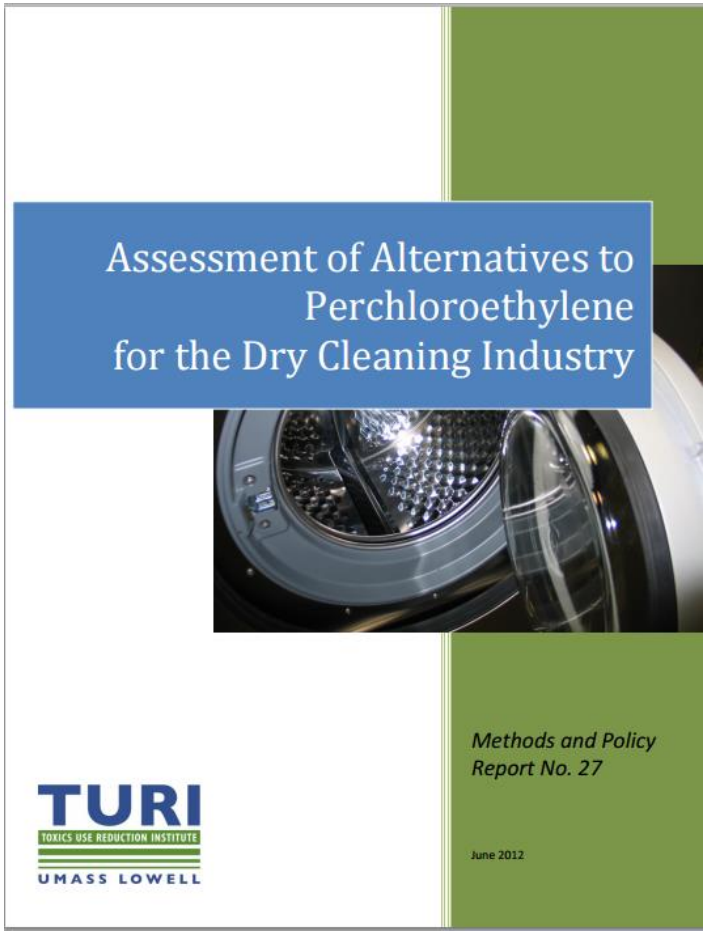
Chronic toxicity

- The US National Toxicology Program proposes classifying n-propyl bromide as "Reasonably anticipated to be a human carcinogen." NTP states that overall, the available experimental studies demonstrate (1) that 1-bromopropane is carcinogenic in experimental animals causing tumors at multiple tissue sites in two rodent species and (2) that 1-bromopropane causes molecular alterations that are relevant for human carcinogenicity.

May 15, 2014 3

Alternatives Assessment

- Technical Performance
  - functionality, availability and technical viability
- Environmental / human health hazard
- Financial Assessment
- Life Cycle Thinking
- Sustainability; Social Impacts




TURAData
A community guide to toxics information from Massachusetts' Toxics Use Reduction Act
TURA
Understand
Reports
Success
Collaborate
Glossary
The 2013 TURA Data is here!
For summary results, see the Results to Date and the Report for Massachusetts as a Whole. We have also updated the Dioxin Report for 2013.
The purpose of this site is to make information available to the public about toxics use in their communities. This information has been collected from companies as a result of Massachusetts' Toxics Use Reduction Act (TURA). To help you understand this information, we have organized it into the following sections:
What Is TURA?
A description of the Toxics Use Reduction Act, including an overview, brief history, objectives and frequently asked questions.
How to Understand the TURA Reports
If you are wondering "What does it all mean?" then this is the place to start. We describe the information that companies actually report, define the terms that you will see on reports, and explain the rules that govern reporting.
Reports by Community, Company or Chemical
Reports showing the amount of toxics used, the
Search for TURA reports by community, company, or chemical.
Enter all or part of a community name (Note: Some companies use unofficial community names):
Find Community
Enter all or part of a company name:
Find Company
Enter all or part of a chemical name:

TURA Data
A community guide to toxics information from Massachusetts' Toxics Use Reduction Act

Chemical Search Results

TURA | Understand | Reports | Success | Collaborate | Glossary

Chemical: **HYDROGENFLUORIDE**
CAS: **7664393**
Company: **WYMAN GORDON COMPANY**
244 WORCESTER ST
NORTH GRAFTON, MA 015360000
ID: **130861**
SIC: **3462 Iron and steel forgings**
Year(s): **All reported years between 1990 and 2013**

Click here to read this company's statement about its TURA information

To return to the chemical report, click here.

Summary Report
(All quantities are in pounds)

To see the supporting detail for this report, click here.

What happened to the total quantity used for HYDROGENFLUORIDE

Year	Total Used	Byproduct	Shipped	Releases
1990	258,500	245,800	0	5,455
1991	98,417	93,650	0	107
1992	104,908	100,718	0	214
1993	157,643	151,012	0	971
1994	138,467	108,799	0	890
1995	130,992	103,969	0	880
1996	142,600	118,404	0	958
1997	177,000	7,200	0	1,194
1998	166,500	141,700	0	1,051
1999	143,100	130,100	0	904
2000	260,800	155,000	0	1,768
2001	231,730	138,035	0	1,490
2002	191,740	122,255	0	1,285

TURA Data
A community guide to toxics information from Massachusetts' Toxics Use Reduction Act

Chemical Search Results

TURA | Understand | Reports | Success | Collaborate | Glossary

Chemical: **HYDROGENFLUORIDE**
CAS: **7664-39-3**
Company: **WYMAN GORDON COMPANY**
244 WORCESTER ST
NORTH GRAFTON, MA 015360000
ID: **130861**
SIC: **3462 Iron and steel forgings**
Year(s): **2013**

Click here to read this company's statement about its TURA information

To return to the chemical report, click here.

Summary Report
(All quantities are in pounds)

What happened to the total quantity used for HYDROGENFLUORIDE

Year	Total Used	Byproduct	Shipped	Releases
2013	493,900	266,575	0	2,910

Total quantity used for HYDROGENFLUORIDE

Year	Manufactured	Processed	Otherwise Used	Total Used
2013	0	0	493,900	493,900

Detail Report

The following production units used **HYDROGENFLUORIDE**

Prod Unit	Production Unit Description	Product Description
6	ACID/ALKALI TREATMENTS;BLENDING&MIXING;MATERIALS HANDLING&STORAGE;WASTEWATER TREATMENT;CLEANING-INPUTS&PRODUCT.	STAINLESS STEEL ALLOY FORGINGS

Focus on Higher Hazard Substances

- Designated by the TURA Administrative Council, after recommendations by the Science Advisory Board and TURI
- Thus far:
  - Methylene chloride
  - Formaldehyde
  - Hexavalent chromium
  - Perchloroethylene
  - Trichloroethylene
  - Cadmium and cadmium compounds

New HHS for 2016

- Cyanide compounds
- Dimethylformamide (DMF)
- n-propyl bromide (nPB)
- Hydrogen fluoride

TUR Reporting

- Annual reports on amounts used, wasted, shipped in product, released onsite, or shipped offsite as pollution
- Affects ≈ 500 companies employing 10 or more FTEs that also use above threshold amounts of one or more of ≈ 1000 TURA listed chemicals
- Makes companies aware of quantities they use and waste

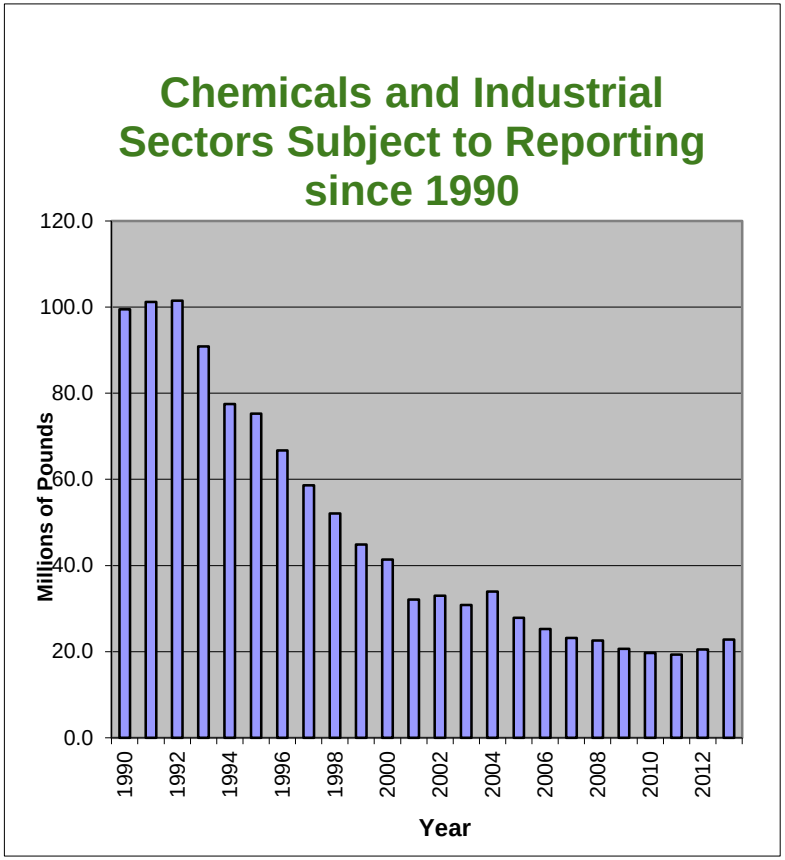
Report Review and Data Analysis

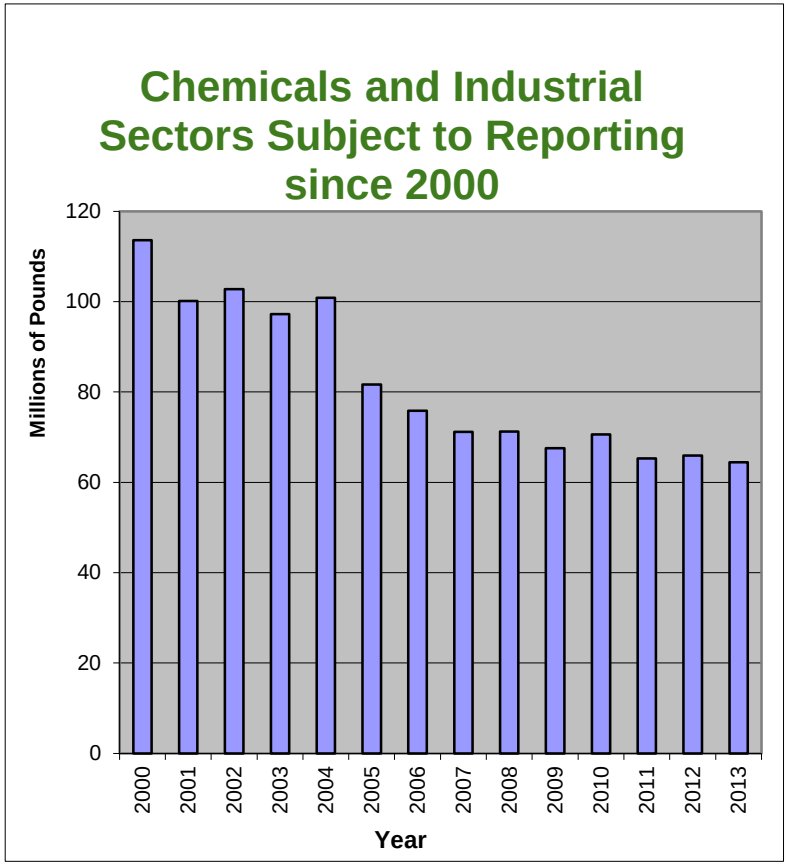
- Review and validate reported data
- Prepare annual “Data Release”
- Make data available on MassDEP Website and provide to TURI

Data Show Program is Working:

- Reported data indicate that 93% of the 1341 facilities that have ever been subject to TURA have implemented TUR
- 76% of companies reported the intent to implement one or more TUR options found in 2014, the most recent planning cycle
- Facilities open in 1993 had reduced use 20%, waste 46% and releases to the environment 89% by 2013
- National Toxics Release Inventory Data show that MA companies implement TUR more frequently than companies in all except three other states

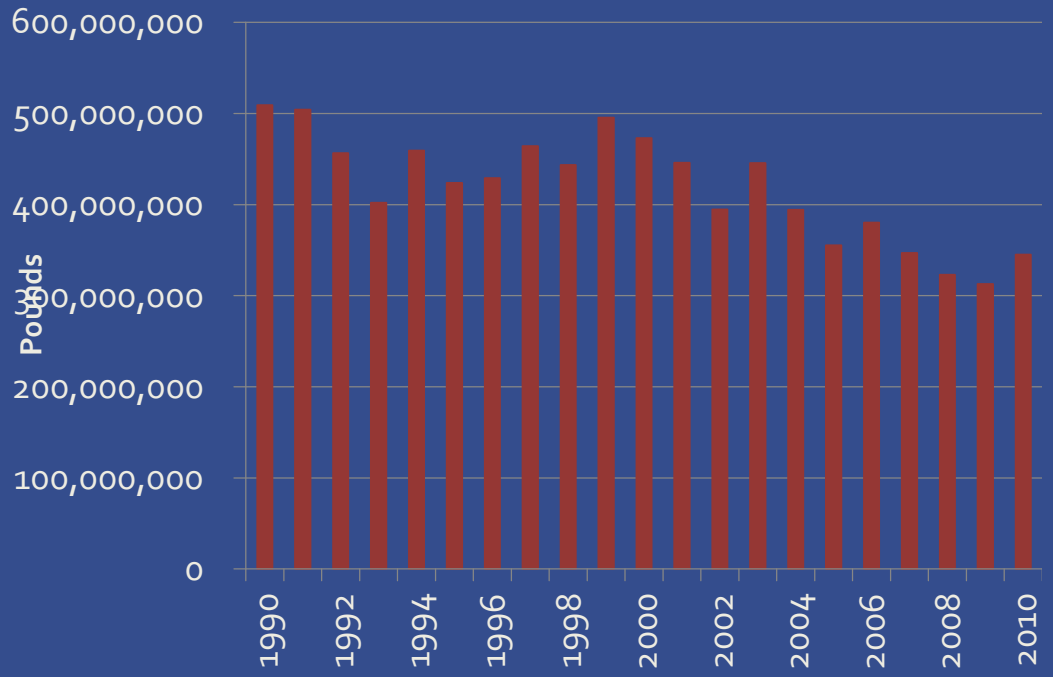
Data Show Program is Working:
Production Adjusted Reductions in Pounds of Waste





Toxics Use Reduction & Disease Prevention

Reported Use of Known & Suspected Carcinogens



Total Use (1990-2010) declined 32%; Excluding styrene: 53% decline

Economic Benefits of Toxics Use Reduction

- Savings in operating costs from TUR implementation:
  - $88 million from 1990 to 1997
  - $43 to $50 million from 2000 to 2009
- Reduced costs for OSHA and EPA compliance, occupational illness and lost work days.
- Improved regulatory compliance, reducing fines and penalties.
- Enhanced competitiveness in international markets.

Lessons learned

- Value of collecting regular TUR data
  - Track progress
  - Understand where interventions are needed
- Value of planning/education
- Value of government support for innovation
- Limits: products entering from outside the state