2005 Toxics Use Reduction Information Release



Commonwealth of Massachusetts
Executive Office of Energy and Environmental Affairs
Department of Environmental Protection

Developed in collaboration with:
Office of Technical Assistance and Technology
Toxics Use Reduction Institute

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Executive Summary

The Toxics Use Reduction Act (TURA) Program now has 16 years of toxics use information in Massachusetts. This information shows that manufacturers and other businesses statewide have reduced their reliance on toxic chemicals dramatically, making Massachusetts the national leader in demonstrable reductions in toxic chemical use and providing clear evidence that the state has made tremendous progress in pollution prevention. Through toxics use reduction, Massachusetts businesses have reduced chemical transportation risks, workplace hazards, reduced toxics in products, reduced waste, and saved money.

In 2005, 615 facilities reported the use of 179 listed toxic substances. These facilities fell within certain standard industrial classification (SIC) codes, had ten or more full-time employees, and used listed toxic substances at or above reporting thresholds. In total (including trade secret data), these facilities reported:

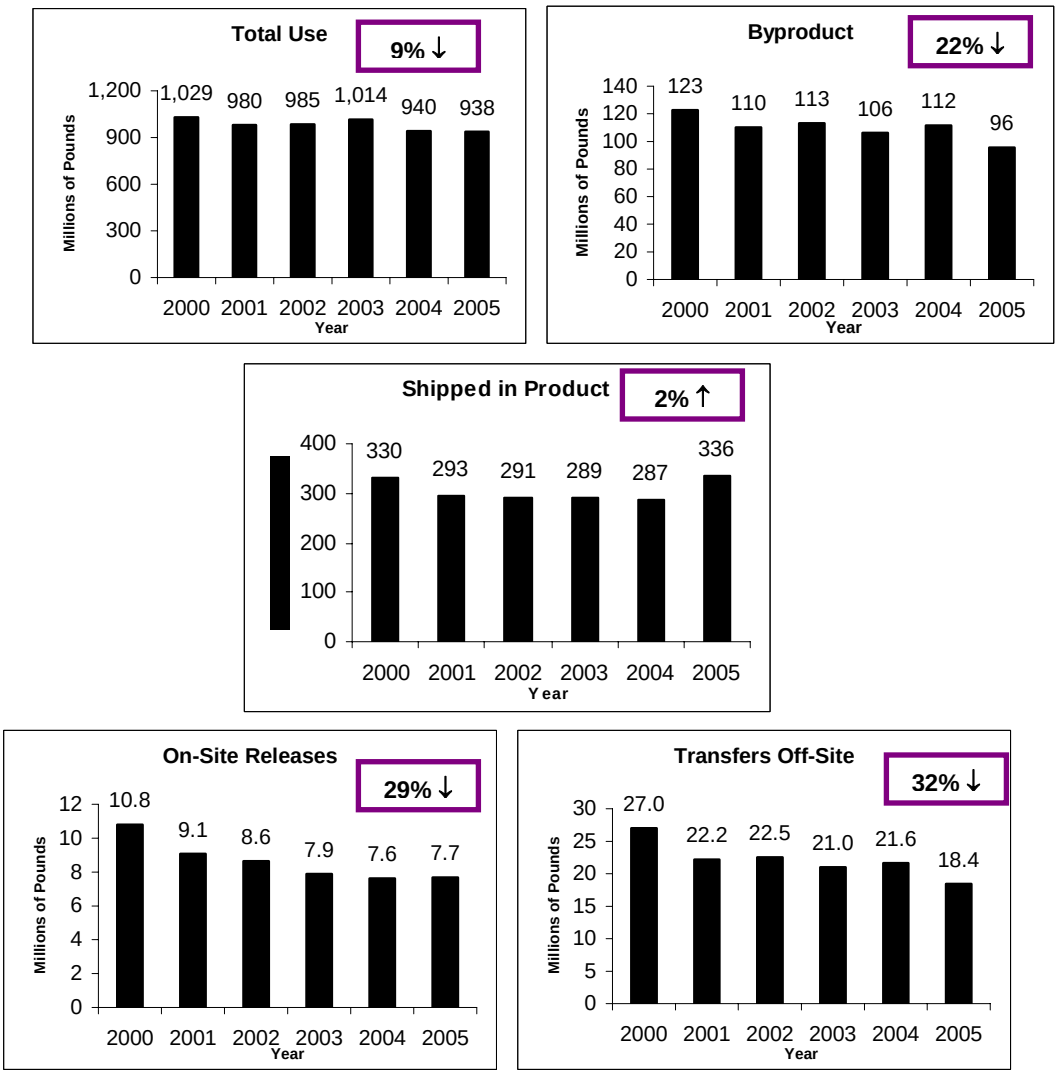
- 1.1 billion pounds of toxic substances used (the same as 1.1 billion pounds in 2004),
- 94 million pounds of toxic byproduct (or waste) generated (down from 111 million pounds in 2004),
- 410 million pounds of toxics shipped in or as products (up from 371 million pounds in 2004),
- 9 million pounds of toxics released to the environment (the same as 9 million pounds in 2004), and
- 32 million pounds of toxics transferred off-site for further waste management (down from 35 million pounds in 2004).

Year to year comparisons of raw TURA data do not always show actual progress in toxics use reduction since production levels and reporting requirements change over time. To account for these changes, the TURA program measures progress by using reported data (excluding trade secret data) normalized for changes in production and using a consistent set of chemicals and industries subject to reporting over a given period of time (referred to as a "Core Group"). Data is presented below for two core groups, a 2000 Core Group and a 1990 Core Group.

In 2005, the **2000 Core Group**, which includes only those industry categories and chemicals subject to reporting in 2000 and 2005, used 795 million pounds, or 90% of the toxic chemicals reported (which is 887 million pounds excluding trade secret data). Adjusting the data to account for a 15% decrease in production from 2000 to 2005, over that five-year period (see Figure 1), the 2000 Core Group facilities:

- reduced toxic chemical use by 9%,
- reduced toxic byproducts by 22%,
- increased toxics shipped in product by 2%,
- reduced on-site releases of toxics to the environment by 29%, and
- reduced transfers of toxics off-site for further waste management by 32%.

Figure 1 – 2000 Core Group Toxics Use Reduction Progress From 2000 to 2005 (Production Adjusted)



When data are not adjusted for changes in production from 2000 to 2005, the **2000 Core Group** facilities reduced:

- toxic chemical use by 23% (from 1,029 million pounds in 2000 to 795 million pounds in 2005),
- toxic byproducts by 34% (from 123 million pounds in 2000 to 81 million pounds in 2005),
- toxics shipped in product by 14% (from 330 million pounds in 2000 to 285 million pounds in 2005),
- on-site releases of toxics to the environment by 40% (from 11 million pounds in 2000 to 7 million pounds in 2005), and
- transfers of toxics off-site for further waste management by 42% (from 27 million pounds in 2000 to 16 million pounds in 2005).

In 2005, the **1990 Core Group**, which includes only those industry categories and chemicals subject to reporting in 1990 and 2005, used 491 million pounds, or 55% of the toxic chemicals reported (which is 887 million pounds excluding trade secret data). Adjusting the data to account for a 9% increase in production from 1990 to 2005, over that fifteen-year period the 1990 Core Group facilities reduced:

- toxic chemical use by 40%,
- toxic byproducts by 71%,
- toxics shipped in product by 41%,
- on-site releases of toxics to the environment by 91%, and
- transfers of toxics off-site for further waste management by 60%.

When 1990 Core Group data are not adjusted for changes in production from 1990 to 2005, the **1990 Core Group** facilities reduced:

- toxic chemical use by 35% (from 752 million pounds in 1990 to 491 million pounds in 2005),
- toxic byproducts by 69% (from 100 million pounds in 1990 to 31 million pounds in 2005),
- toxics shipped in product by 36% (from 157 million pounds in 1990 to 101 million pounds in 2005),
- on-site releases of toxics to the environment by 90% (from 20 million pounds in 1990 to 2 million pounds in 2005), and
- transfers of toxics off-site for further waste management by 55% (from 20 million pounds in 1991[1] to 9 million pounds in 2005).

2005 was the sixth year TURA facilities reported on chemicals now classified as persistent bio-accumulative toxic (PBT) chemicals by the U.S. Environmental Protection Agency (EPA) under the Toxics Release Inventory (TRI) Program (see Table 1). PBT chemicals are of special concern because they are highly toxic, remain in the environment for long periods of time, are not readily destroyed, and build up in the food chain. In 2005, no facilities reported the use of tetrabromobisphenol or hexachlorobenzene, both of which had been reported by one facility each in 2003.

[1] Trends are measured from 1991 due to a change in the definition of Transfers Off-Site that year.

Table 1 2005 PBT Summary (in pounds unless otherwise noted)							
PBT Chemical/ Chemical Category	**Reporting Threshold**	**Number of Facilities**	**Total Use**	**Generated as Byproduct**	**Shipped in Product**	**On-Site Releases**	**Transfers Off-Site**
Polycyclic Aromatic Compounds (PACs)	100 lbs.	126	11,123,853	5,639	81,330	939	5,476
Benzo(g,h,i) perylene	10 lbs.	109	128,780	150	2,445	36	82
Mercury	10 lbs.	22	10,444	7,115	4,052	1,449	5,959
Mercury Compounds	10 lbs.	6	1,031	343	172	211	123
Poly-chlorinated biphenyls (PCBs)	10 lbs.	2	21,741	21,733	8	0	21,733
Dioxin and Dioxin-like Compounds	0.1 Grams	17	6,696.330 Grams	6,696.330 Grams	0.000 Grams	560.525 Grams	5,861.316 Grams
Lead	100 lbs.	115	3,711,039	2,822,852	878,088	852,821	1,906,686
Lead Compounds	100 lbs.	125	3,689,271	22,465	3,252,393	9,000	215,214

The TURA program has achieved its sustained success through the efforts of Massachusetts industry working with state government to implement the goals of the TURA program. Massachusetts facilities have reduced significant amounts of waste by implementing toxics use reduction techniques, including input substitution, production unit modernization, production unit redesign, improved operation and maintenance, and recycling and reuse of chemicals in their production processes. They have demonstrated that toxics use reduction not only reduces toxic chemical use and waste, but also saves businesses money over the long term.

The first decade of TURA was considered a success when TURA filers met the goal of reducing toxic byproduct generation by 50%. Overall use of toxic chemicals and toxic byproducts decreased from 2004 to 2005, showing continued TUR progress by TURA filers.

I. Introduction

The Toxics Use Reduction Act (TURA) requires Massachusetts facilities that fall within certain standard industrial classification (SIC) codes, have ten or more full-time employees, and use listed toxic substances at or above reporting thresholds to report their chemical use annually to the Massachusetts Department of Environmental Protection (MassDEP) and pay an annual toxics use fee. TURA also requires reporting facilities to develop toxics use reduction plans that identify and evaluate opportunities to reduce the use of toxics and the generation of toxic byproducts. These plans must be updated every two years and approved by a MassDEP-certified toxics use reduction planner.

In addition to MassDEP's administration of reporting and planning requirements, the TURA program is supported by the Office of Technical Assistance and Technology (OTA) and the Toxics Use Reduction Institute (TURI). OTA provides non-regulatory technical assistance to facilities seeking to reduce the use of toxics, develops fact sheets and other technical guidance documents, supports the development of technology solutions by leveraging state and federal funding, and creates market-based incentives to reduce toxics use for qualifying TURA filers. TURI provides toxics use reduction education, training, and library services; supports research on cleaner materials and processes; and operates a laboratory for testing non-toxic or less-toxic cleaning alternatives. TURI also makes TURA data available on its website in a user-friendly way that is searchable by community, chemical or company. See www.turi.org/turadata.

This 2005 Toxics Use Reduction Information Release contains important chemical information that is useful to the public, government, and industry. However, it is important to note that because the data in this report are collected only from facilities within certain industrial sectors that have ten or more full-time employees and that use certain chemicals above established reporting thresholds, this report does not provide a complete picture of the use and release of all chemicals. In addition, this report does not contain information about exposures of the public to reported chemicals.

For more information about the TURA program, please visit the following web sites:

Massachusetts Department of Environmental Protection,
Toxics Use Reduction Program: www.mass.gov/dep/toxics/toxicsus.htm

Office of Technical Assistance and Technology: www.mass.gov/envir/ota

Toxics Use Reduction Institute: www.turi.org

II. TURA Progress 1990-2005

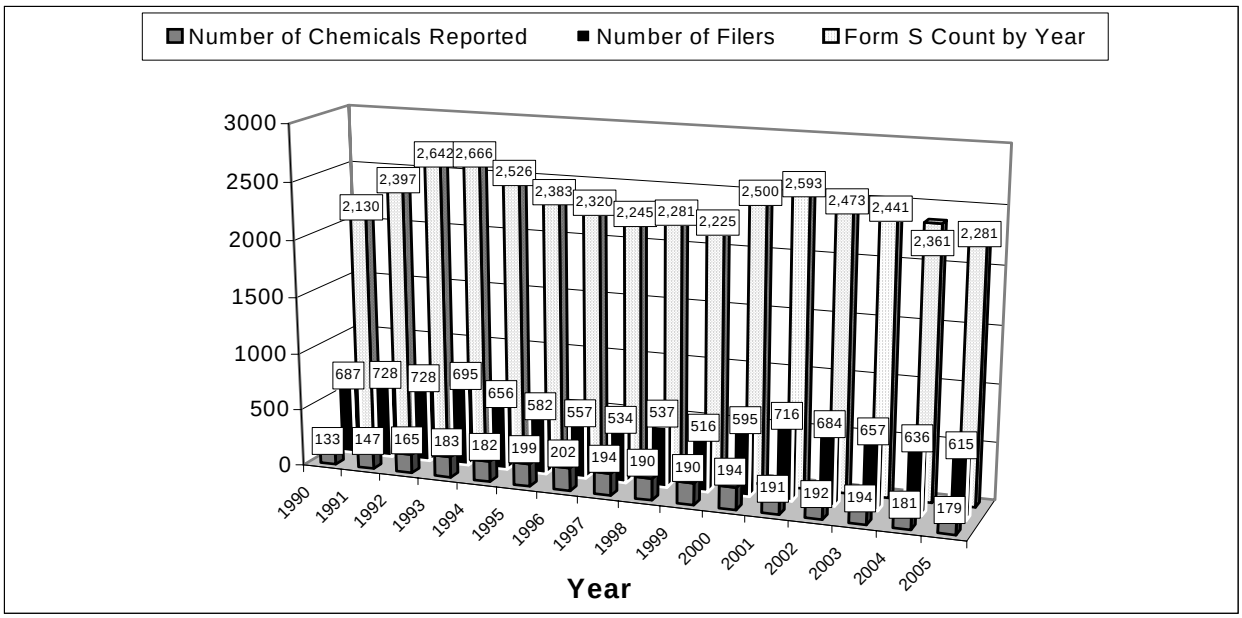
Since 1990, when the TURA program began, Massachusetts TURA filers have made substantial progress in reducing their use of toxic substances and their generation of toxic byproducts. In measuring this progress, a number of changes in the TURA reporting universe must be taken into account.

In 1990, only manufacturing firms were required to report to the TURA program. Then, in accordance with TURA's phase-in schedule, the reporting universe was expanded to include industries beyond the manufacturing sector. The list of chemicals subject to reporting also was expanded in reporting years 1991, 1992, 1993, 2000, and 2001, further enlarging the universe of companies reporting. In addition, over the years, certain chemicals have been de-listed. For example, effective reporting year 1999, the Administrative Council on Toxics Use Reduction de-listed pure copper in solid or molten metal form.

Figure 2 illustrates TURA filing trends over the past sixteen years. Out of 1,422 chemicals listed under TURA, only 179 were reported in 2005, down from 181 in 2004. The number of facilities reporting under TURA generally declined during the 1990s, from a high of 728 facilities in 1991 and 1992, to 516 in 1999. The number of reporting facilities increased to 595 in 2000 due in part to the new requirement to report PBTs at lower thresholds, and further increased to 716 in 2001 due to the new requirement to report lead and lead compounds (both PBTs) at lower 100 pound thresholds. The number of filers has decreased steadily since then to 615 in 2005, due in part to reduced chemical use, facilities closing or leaving Massachusettts, or reduced production due to economic conditions.

The number of individual Form Ss[2] declined from a high of 2,666 in 1993 to 2,225 in 1999, increased to 2,500 in 2000, again due partly to the reporting of PBTs, and increased to 2,593 in 2001 due to the new reporting requirement for lead and lead compounds. The number of Form Ss has decreased since then to 2,281 in 2005, consistent with the decline in the number of TURA filers.

Figure 2 - TURA Filer Trends 1990 – 2005



[2] A separate Form S is required for each chemical reported by a facility; the Form S is the form used to report chemical use information.

2000 Core Group Progress – Without Adjusting for Production

Since TURA reporting requirements have changed over time, TURA progress is best measured by using a consistent set of chemicals and industries subject to reporting over a given period of time (referred to as a "Core Group").

To measure recent progress, the TURA program has defined a 2000 Core Group that includes facility categories and chemicals that were subject to reporting in 2000 and that remained subject to reporting in 2005[3]. In 2005, the 2000 Core Group used 795 million pounds, or 90% of the toxic chemicals reported (which is 887 million pounds excluding trade secret data).

The changes in reported Core Group quantities over the period 2000 to 2005 are shown in Figure 3. These quantities have not been adjusted for changes in production. From 2000 to 2005, Core Group filers reduced:

- toxic chemical use by 23% (from 1,029 million pounds in 2000 to 795 million pounds in 2005),
- toxic byproducts by 34% (from 123 million pounds in 2000 to 81 million pounds in 2005),
- toxics shipped in product by 14% (from 330 million pounds in 2000 to 285 million pounds in 2005),
- on-site releases of toxics to the environment by 40% (from 11 million pounds in 2000 to 7 million pounds in 2005), and
- transfers of toxics off-site for further waste management by 42% (from 27 million pounds in 2000 to 16 million pounds in 2005).

2000 Core Group Progress – Production Adjusted Data

From 2000 to 2005, 2000 Core Group filers reported a 15% decrease in production. In order to more accurately measure progress, the TURA data are adjusted or normalized to eliminate the effects of changes in production using production ratios reported by the Core Group facilities.

The following example illustrates how data are adjusted to reflect changes in production:

- In year 1, a facility produces 1,000 machine parts, and generates 100 lbs. of byproduct.
- In year 2, the facility produces 10% less machine parts (900). Therefore, the production ratio is .90. However, the facility only generates 80 lbs. of byproduct.
- The production adjusted byproduct for year 2 is 80 lbs./.90 = 89 lbs.
- The production adjusted percent change from year 1 to year 2 is [100-89]/100 = .11, or an 11% reduction, while its actual byproduct reduction is 20%.

From 2000 to 2005 (see Figure 4), when adjusted for production, the 2000 Core Group facilities :

- reduced toxic chemical use by 9%,
- reduced toxic byproducts by 22%,
- increased toxics shipped in product by 2%;
- reduced on-site releases of toxics to the environment by 29%, and
- reduced transfers of toxics off-site for further waste management by 32%.

[3] The 2000 Core Group includes all SIC codes and all chemical use except use of respirable crystalline silica (which was first reportable in 2001), use of lead and lead compounds due only to the lower 100 pound thresholds for lead and lead compounds that took effect in 2001, municipal waste combustor combustion-related emissions first reportable in 2003, and use of any chemical covered by a trade secret claim.

Figure 3 – 2000 Core Group Toxics Use Reduction Progress From 2000 to 2005 (Not Production Adjusted)

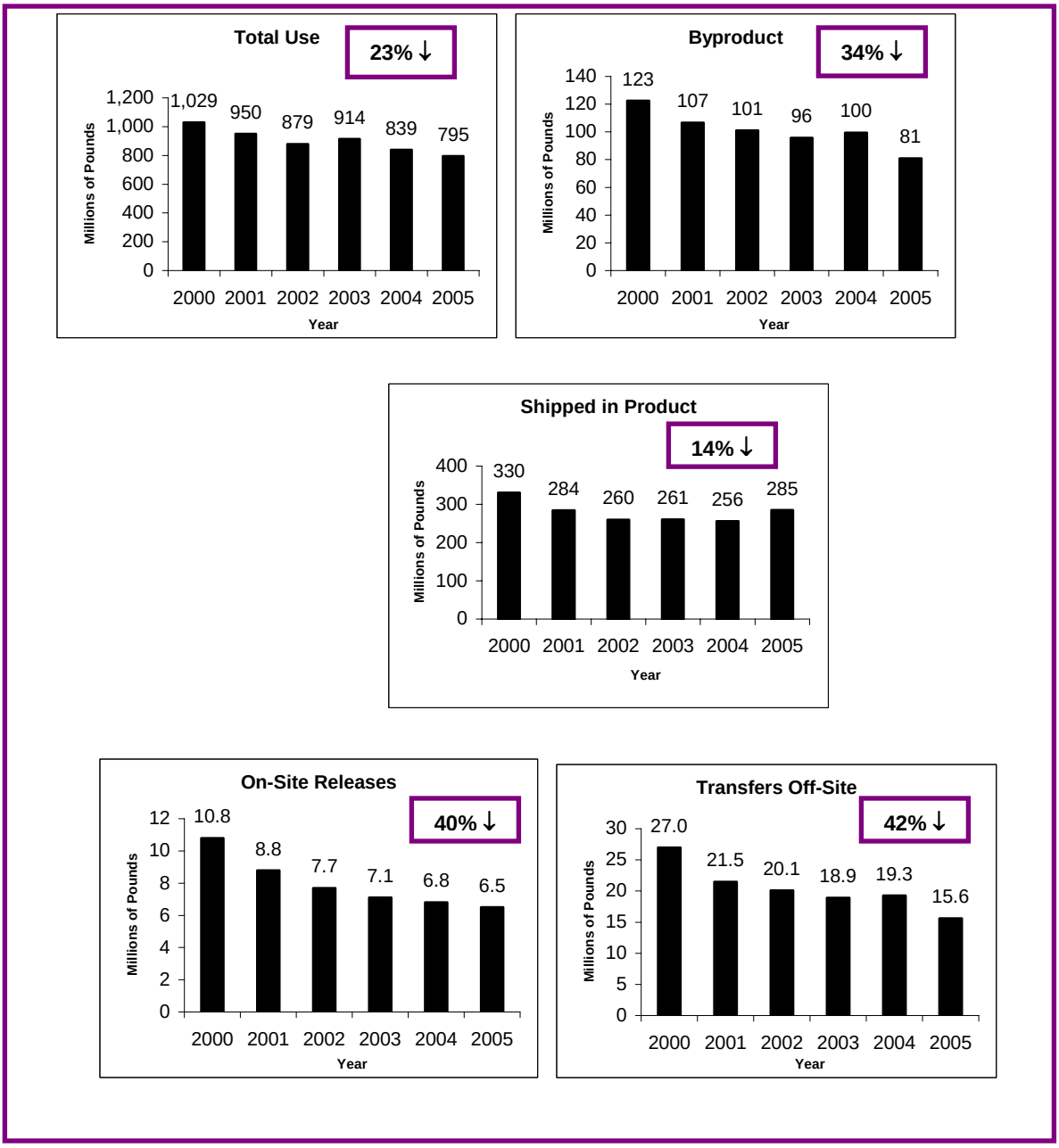
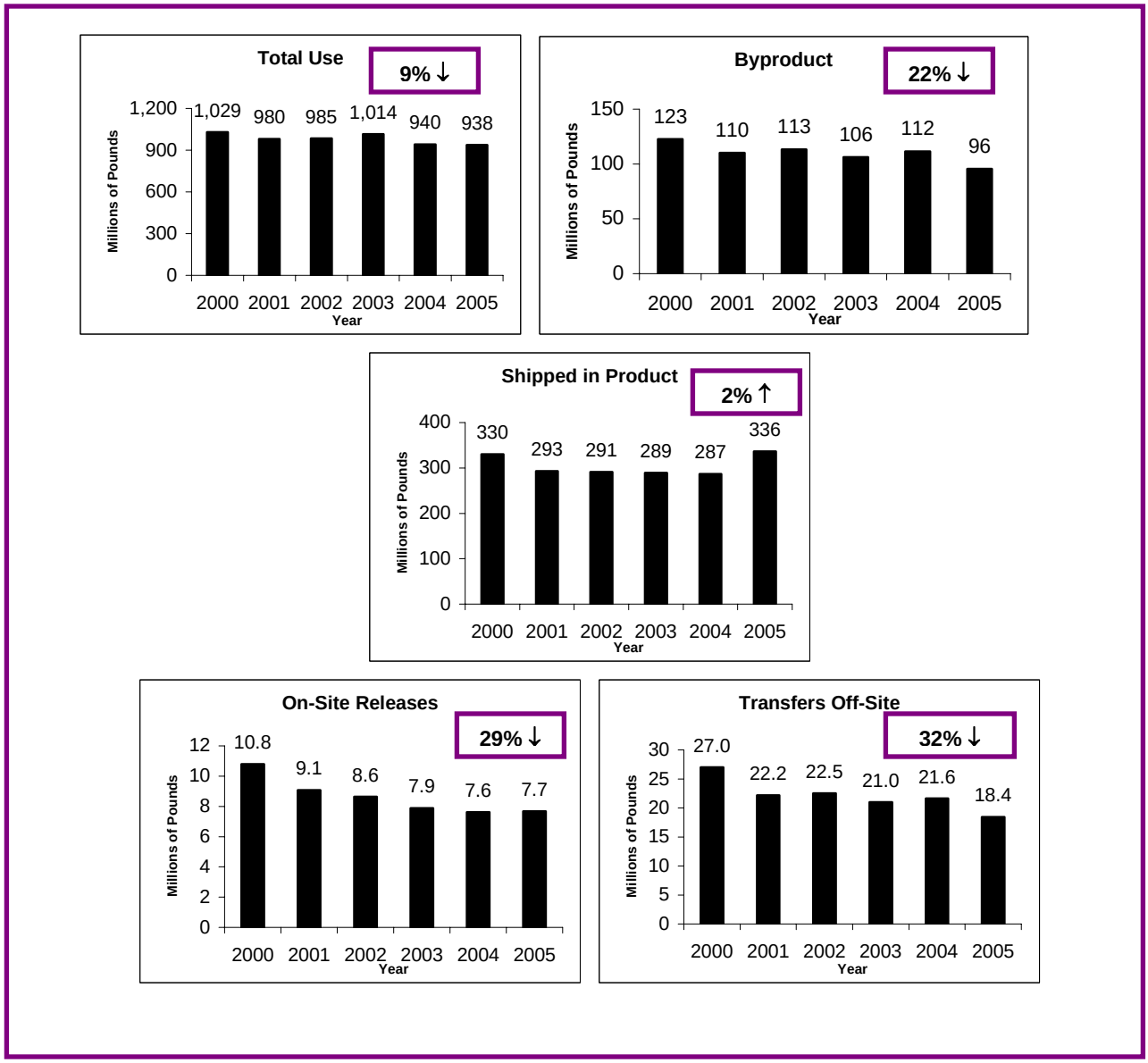


Figure 4 – 2000 Core Group Toxics Use Reduction Progress From 2000 to 2005 (Production Adjusted)



1990 Core Group Progress – Without Adjusting for Production

To measure progress since the start of the TURA program, the program uses a 1990 Core Group that currently represents just over half of the total toxics use. In 2005, the 1990 Core Group used 491 million pounds, or 55% of the toxic chemicals reported (which is 887 million pounds excluding trade secret data).

The changes in reported 1990 Core Group quantities over the period 1990 to 2005 are shown in Figure 5. These quantities have not been adjusted for changes in production. From 1990 to 2005, 1990 Core Group filers reduced:

- toxic chemical use by 35% (from 752 million pounds in 1990 to 491 million pounds in 2005),
- toxic byproducts by 69% (from 100 million pounds in 1990 to 31 million pounds in 2005),
- toxics shipped in product by 36% (from 157 mi1lion pounds in 1990 to 101 million pounds in 2005),
- on-site releases of toxics to the environment by 90% (from 20 million pounds in 1990 to 2 million pounds in 2005), and
- transfers of toxics off-site for further waste management by 55% (from 20 million pounds in 1991[4] to 9 million pounds in 2005).

1990 Core Group Progress - Production Adjusted Data

From 1990 to 2005, 1990 Core Group filers reported a 9% increase in production. When the Core Group data are adjusted to account for changes in production since 1990 (see Figure 6), Core Group filers reduced:

- toxic chemical use by 40%,
- toxic byproducts by 71%,
- toxics shipped in product by 41%,
- on-site releases of toxics to the environment by 91%, and
- transfers of toxics off-site for further waste management by 60%.

[4] Trends are measured from 1991 due to a change in the definition of Transfers Off-Site that year.

Figure 5 – 1990 Core Group Toxics Use Reduction Progress From 1990 to 2005 (Not Production Adjusted)

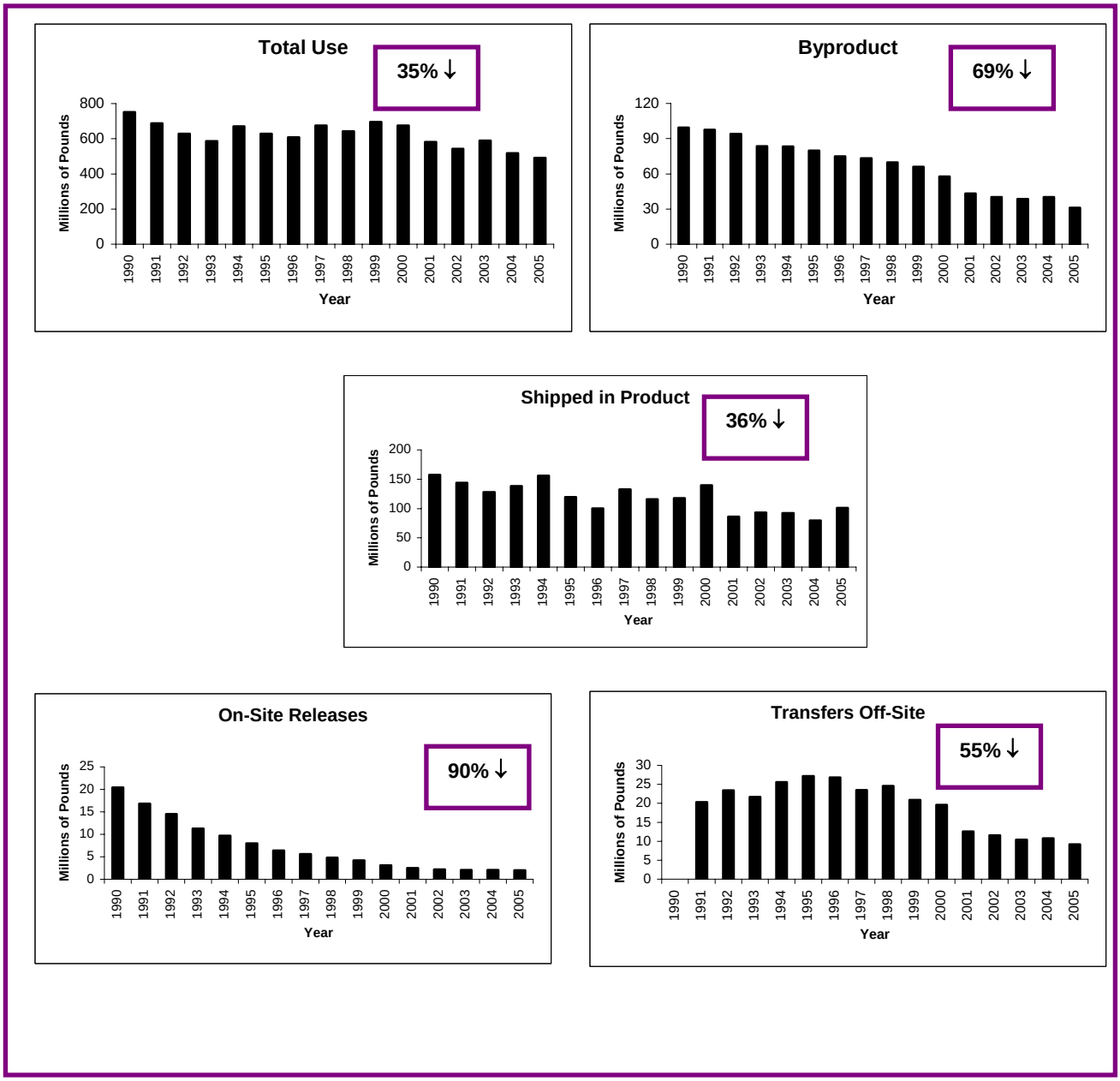


Figure 6 – 1990 Core Group Toxics Use Reduction Progress From 1990 to 2005 (Production Adjusted)

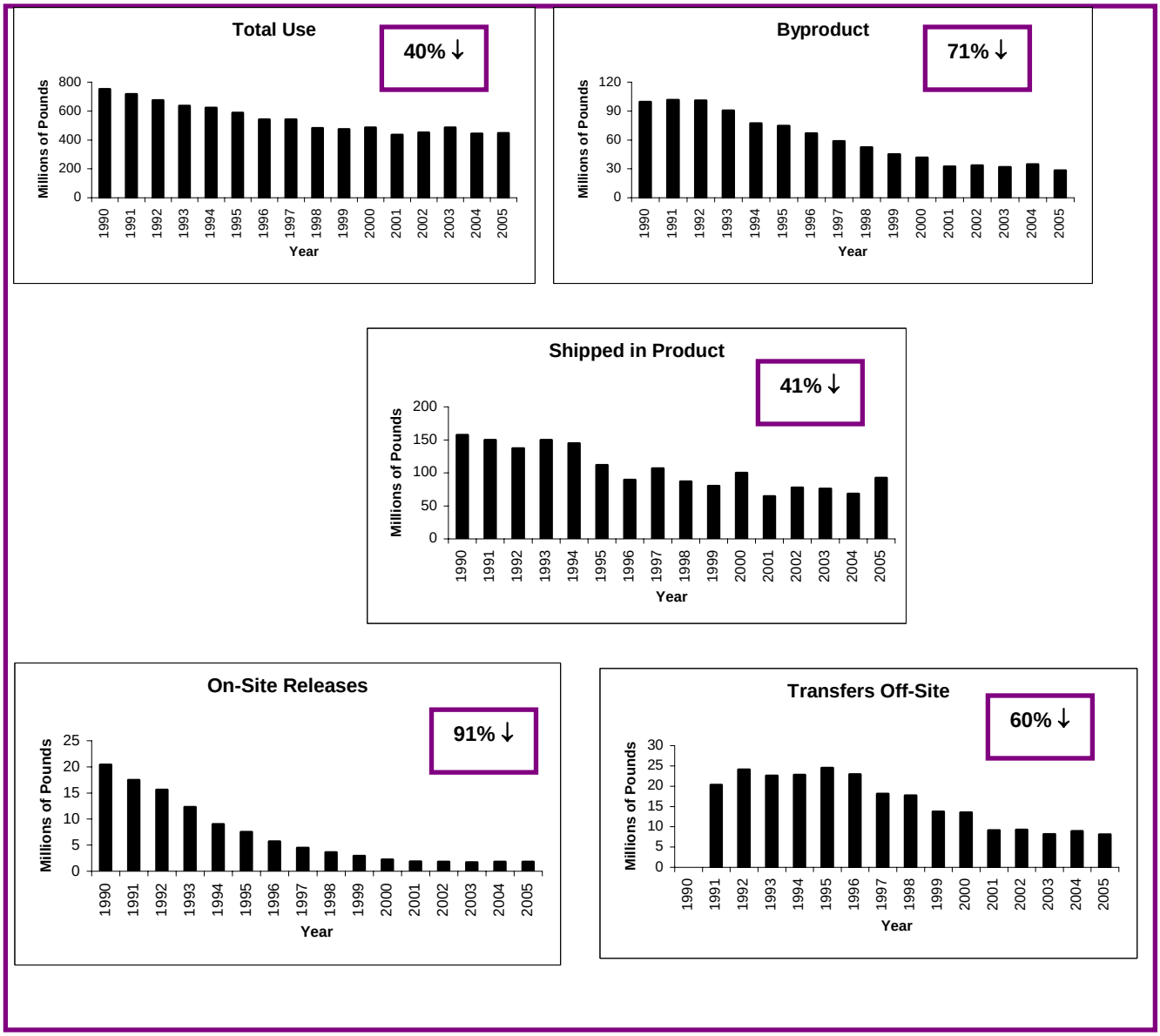


Table 2 and Table 3 summarize TURA data from 2000 to 2005, and from 1990 to 2005, respectively, showing both **reported** and **production adjusted** quantities. For each category, each year's production adjusted quantity is normalized to the base year production level, thus providing a comparison of production-adjusted quantities to base year quantities. Quantities in shaded boxes are adjusted for changes in manufacturing activity (level of production) using the facility-reported Production Ratio/Activity Index. For the 2000 Core Group, the activity index shows a decrease in production of 15 percent from 2000 to 2005. For the 1990 Core Group, the activity index shows an increase in production of 9 percent from 1990 to 2005.

Table 2
2000 CORE GROUP DATA: 2000 - 2005 TREND SUMMARY

(Quantities are in millions of pounds, does not include trade secret quantities. Shaded columns show production-adjusted quantities.)

	TOTAL USE		**BYPRODUCT**		**SHIPPED IN PRODUCT**		**ON-SITE RELEASES**		**TRANSFERS OFF-SITE**		**ACTIVITY INDEX**[5]
2000	1,028.66	1,028.66	122.60	122.60	330.30	330.30	10.80	10.80	27.00	27.00	NA
2001	950.39	979.78	106.70	110.00	284.20	292.99	8.80	9.07	21.50	22.16	0.97
2002	879.25	985.26	101.00	113.18	259.50	290.79	7.70	8.63	20.10	22.52	0.92
2003	914.00	1,014.06	95.70	106.18	260.60	289.13	7.10	7.88	18.90	20.97	1.01
2004	839.00	940.26	99.50	111.51	255.80	286.67	6.80	7.62	19.30	21.63	0.99
2005	794.97	937.80	81.00	95.55	285.20	336.44	6.50	7.67	15.60	18.40	0.95
Percent Change 2000-2005	23% Reduction	9% Reduction	34% Reduction	22% Reduction	14% Reduction	2% Increase	40% Reduction	29% Reduction	42% Reduction	32% Reduction	15% Decrease

[5] The Production Ratio / Activity Index reported by each facility measures the change in production from the previous reporting year to the current reporting year.

Table 3
1990 CORE GROUP DATA: 1990 - 2005 TREND SUMMARY

(Quantities are in millions of pounds, does not include trade secret quantities. Shaded columns show production-adjusted quantities.)

	TOTAL USE		BYPRODUCT		SHIPPED IN PRODUCT		ON-SITE RELEASES		TRANSFERS OFF-SITE[6]		ACTIVITY INDEX[7]
1990	752.0	752.0	99.5	99.5	157.2	157.2	20.4	20.4			NA
1991	688.0	716.7	97.5	101.6	144.0	150.0	16.8	17.5	20.3	20.3	0.96
1992	629.0	675.5	94.0	100.9	127.8	137.2	14.5	15.6	23.4	24.1	0.97
1993	587.0	636.7	83.4	90.5	138.2	149.9	11.3	12.3	21.7	22.6	0.99
1994	671.0	622.1	83.2	77.1	156.0	144.6	9.7	9.0	25.6	22.8	1.17
1995	628.0	588.1	79.8	74.7	119.3	111.7	8.0	7.5	27.2	24.5	0.99
1996	608.0	542.3	74.8	66.7	100.2	89.4	6.4	5.7	26.8	22.9	1.05
1997	675.0	542.4	73.1	58.7	132.7	106.6	5.6	4.5	23.5	18.1	1.11
1998	642.0	482.1	69.6	52.3	115.7	86.9	4.8	3.6	24.6	17.7	1.07
1999	695.0	474.5	66.0	45.1	117.4	80.1	4.2	2.9	20.9	13.7	1.10
2000	675.0	485.1	57.8	41.5	139.5	100.2	3.1	2.2	19.6	13.5	0.95
2001	581.0	434.9	43.3	32.4	86.4	64.7	2.5	1.9	12.6	9.1	0.96
2002	542.0	450.8	40.2	33.4	93.2	77.5	2.2	1.8	11.6	9.3	0.90
2003	589.0	485.0	38.5	31.7	92.4	76.1	2.1	1.7	10.4	8.2	1.01
2004	517.0	443.5	40.3	34.6	79.5	68.2	2.1	1.8	10.8	8.9	0.96
2005	491.0	448.1	31.1	28.4	101.3	92.4	2.0	1.8	9.2	8.1	0.94
Percent Change 1990-2005	35% Reduction	40% Reduction	69% Reduction	71% Reduction	36% Reduction	41% Reduction	90% Reduction	91% Reduction	55% Reduction	60% Reduction	9% Increase

[6] Trends are measured from 1991 due to a change in the definition of Transfers Off-Site that year.

[7] The Production Ratio / Activity Index reported by each facility measures the change in production from the previous reporting year to the current reporting year.

III. 2005 TURA Chemical Data

Table 4 summarizes the 2005 data for all TURA filers, including trade secret data, rounded to the nearest million pounds. These companies reported using 1.1 billion pounds of chemicals and generating 94 million pounds of byproduct.

Table 4 - 2005 Data for All TURA Filers (in Pounds) (including trade secret data)	
Total Use	1,114,000,000
Generated as Byproduct	94,000,000
Shipped in Product	410,000,000
On-Site Releases	9,000,000
Transfers Off-Site	32,000,000

The 1.1 billion pounds of chemical use occurred in three categories: manufactured, processed, or otherwise used. In TURA, these terms are defined as follows:

Manufacture – "to produce, prepare, import or compound a toxic or hazardous substance" (e.g., intentional manufacture of a metal compound or the unintentional manufacture of acid gases during combustion of fossil fuels).

Process – "the preparation of a toxic or hazardous substance, including without limitation, a toxic substance contained in a mixture or trade name product, after its manufacture, for distribution in commerce" (e.g., in the formulation of paints or coatings, any listed toxics are "processed;" in the manufacture of polystyrene, the styrene monomer is "processed").

Otherwise Use – "any use of a toxic substance that is not covered by the terms "manufacture" or "process" and includes use of a toxic substance contained in a mixture or trade name product" (e.g., chemicals used to clean parts, chemicals contained in fuels that are combusted).

In this Report, when total use is broken down by type of use (i.e., manufactured, processed, or otherwise used), trade secret data are not included. Thus, the total use in Figure 7 is 887 million pounds, rather than 1.1 billion pounds (which includes trade secret data).

Manufactured Chemicals

Figure 7 shows that relatively little manufacturing of TURA chemicals occurs in Massachusetts. Chemicals reported as "manufactured" accounted for 9% of the total use statewide (or 79 million pounds, down from 90 million pounds in 2004). A significant amount of the chemicals reported as manufactured are not manufactured intentionally, but are coincidentally manufactured as a result of some other activity. Examples include the creation of acid gases from fuel combustion for power generation and the production of nitrate compounds as a result of wastewater treatment.

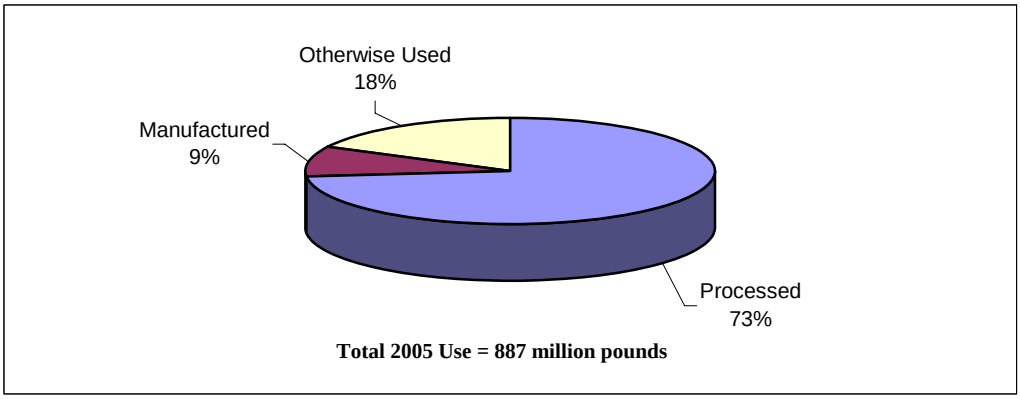
Processed Chemicals

In Massachusetts, the predominant chemical use is "processing," which includes incorporating a listed chemical into a product. Processing of chemicals accounted for 73% of total use (or 652 million pounds, down from 659 million pounds in 2004). Styrene, which is used in the production of plastics, accounted for 42% (or 273 million pounds) of total chemicals processed.

Otherwise Used Chemicals

Chemicals "otherwise used" accounted for 18% of total use (or 156 million pounds, down from 177 million pounds in 2004). Chemicals otherwise used include activities such as parts cleaning, waste treatment, and the combustion of fuel oil containing listed chemicals such as polycyclic aromatic compounds and benzo(g,h,i)perylene.

Figure 7 – 2005 Chemical Use (does not include trade secret data)



Top 20 Chemicals

In 2005, 179 chemicals out of 1,422 TURA-listed chemicals were reported. Of the 179, 20 chemicals accounted for 85%, or 752 million pounds (not including trade secret information), of total use reported statewide (see Table 5). Styrene monomer was the chemical with the largest quantity reported in 2005, accounting for 31% of total use reported (or 273 million pounds, down from 305 million pounds in 2004). Styrene monomer is the building block for various plastics.

Sodium hydroxide was the second highest used chemical with 185 facilities (or 30%) reporting its use, representing 9% of total use reported (or 82 million pounds, the same as in 2004). Sodium hydroxide is used to treat wastewater, neutralize acids, make sodium salts, rayon, plastics, paper and cellophane, and manufacture laundering, bleaching, and dishwashing materials.

Methanol was the third highest used chemical with 45 facilities (or 7%) reporting its use, representing 8% of total use reported (or 68 million pounds, up from 43 million pounds in 2004). Methanol is used in the production of formaldehyde, acetic acid, chloromethanes, methyl methacrylate, methylamines, and dimethyl terephthalate. Facilities use methanol as a solvent or antifreeze in the manufacturing of paint stripper, aerosol spray paints, wall paints, carburetor cleaners, and car windshield washer compounds.

Table 5 - 2005 Top 20 Chemicals: Total Use

Total Use ***These quantities do not include Trade Secret***	
Chemical Name (CAS #)	**Total Use (Lbs.)**
Styrene Monomer (100425)	273,054,868
Sodium Hydroxide (1310732)	82,240,211
Methanol (67561)	68,363,406
Hydrochloric Acid (7647010)	63,650,788
Sodium Hypochlorite (7681529)	33,603,445
Sulfuric Acid (7664939)	32,034,504
Toluene (108883)	28,421,890
Nitrate Compounds (1090)	19,380,090
Potassium Hydroxide (1310583)	19,020,269
Ammonia (7664417)	17,180,189
Methyl Methacrylate (80626)	15,086,988
Zinc Compounds (1039)	14,916,706
Chlorine (7782505)	14,824,266
Methyl Ethyl Ketone (78933)	13,503,403
Ethyl Acetate (141786)	11,140,646
Polycyclic Aromatic Compounds (1040)	11,123,853
Acetone (67641)	9,638,030
Ethylene Glycol (107211)	9,290,343
Toluene Diisocyanate (26471625)	8,131,372
N-Methyl-2-Pyrrolidone (872504)	7,586,096
The following four chemicals would appear in the Top 20 Chemicals Total Use list if trade secret quantities were included: Butyraldehyde, Formaldehyde, Sodium Bisulfite, Vinyl Acetate.	

Table 6 shows the Top 20 chemicals generated as byproduct in 2005, which accounted for 86% (or 81 million pounds) of total byproduct generated statewide. Table 6 also shows the Top 20 chemicals shipped in product in 2005, which accounted for 84% (or 279 million pounds) of total shipped in product.

Table 6 - 2005 Top 20 Chemicals: Byproduct Generation and Shipped in Product

Byproduct Generation *These quantities include Trade Secret*		**Shipped in Product** *These quantities do not include Trade Secret*	
Chemical Name (CAS #)	**Byproduct Generation (Lbs.)**	**Chemical Name (CAS #)**	**Shipped in Product (Lbs.)**
Nitrate Compounds (1090)	9,949,078	Methanol (67561)	64,554,785
Sodium Hydroxide (1310732)	9,429,104	Sodium Hydroxide (1310732)	51,122,369
Toluene (108883)	9,287,032	Sodium Hypochlorite (7681529)	28,917,447
Ethyl Acetate (141786)	9,284,804	Toluene (108883)	18,708,719
Sulfuric Acid (7664939)	8,842,314	Potassium Hydroxide (1310583)	16,197,040
Hydrochloric Acid (7647010)	5,281,026	Chlorine (7782505)	14,494,430
Methanol (67561)	4,241,828	Ammonia (7664417)	11,530,522
Methyl Ethyl Ketone (78933)	3,957,404	Zinc Compounds (1039)	9,265,411
Lead (7439921)	2,822,852	Methyl Ethyl Ketone (78933)	9,226,625
Formaldehyde (50000)	2,799,648	Sulfuric Acid (7664939)	8,915,988
Acetone (67641)	2,607,164	Acetone (67641)	6,784,750
Nitric Acid (7697372)	2,228,183	Ethylene Glycol (107211)	5,884,394
N-Methyl-2-Pyrrolidone (872504)	2,225,045	N-Methyl-2-Pyrrolidone (872504)	5,184,702
Dimethylformamide (68122)	1,738,191	Glycol Ethers (1022)	4,764,101
Ammonia (7664417)	1,131,935	Antimony Compounds (1000)	4,489,555
Phosphoric Acid (7664382)	1,089,110	Dichloromethane (75092)	4,451,734
Sodium Hypochlorite (7681529)	1,005,011	Phosphoric Acid (7664382)	4,257,616
Ethylene Glycol (107211)	994,369	Xylene Mixed Isomer (1330207)	3,922,129
Potassium Hydroxide (1310583)	966,495	Di (2-ethylhexyl) phthalate (117817)	3,489,269
Tetrahydrofuran (109999)	797,646	Lead Compounds (1026)	3,252,393
		The following chemicals would appear in the Top 20 Chemicals Shipped in Product list if trade secret quantities were included: Ethyl Acetate, Sodium Bisulfite, Vinyl Acetate.	

Table 7 shows the Top 20 chemicals reported as on-site releases in 2005, which totaled 92% (or 8 million pounds) of total on-site releases reported. Hydrochloric acid had the highest amount of on-site releases reported statewide, accounting for 35% (or 3 million pounds) of total on-site releases. Two million pounds of hydrochloric acid, or 77% of total on-site releases of hydrochloric acid, were attributed to power plants. Table 7 also shows the Top 20 chemicals reported as transfers off-site in 2005, which totaled 83% (or 27 million pounds) of total transfers off-site. Nitrate compounds had the highest transfers off-site reported statewide, accounting for 18% of total transfers off-site. Nitrate compounds were primarily coincidentally manufactured during neutralization of nitric acid in wastewater treatment.

Table 7 - 2005 Top 20 Chemicals: On-Site Releases and Transfers Off-site

On-Site Releases *These quantities include Trade Secret*		**Transfers Off-Site** *These quantities include Trade Secret*	
Chemical Name (CAS #)	**On-Site Releases (Lbs.)**	**Chemical Name (CAS #)**	**Transfers Off-Site (Lbs.)**
Hydrochloric Acid (7647010)	2,959,614	Nitrate Compounds (1090)	5,962,820
Lead (7439921)	852,821	Formaldehyde (50000)	2,631,802
Ammonia (7664417)	737,415	Toluene (108883)	2,324,466
Sulfuric Acid (7664939)	602,252	Methanol (67561)	2,184,756
Acetone (67641)	507,161	N-Methyl-2-Pyrrolidone (872504)	2,065,748
Toluene (108883)	373,086	Lead (7439921)	1,960,686
Ethyl Acetate (141786)	315,018	Ethyl Acetate (141786)	1,779,203
Glycol Ethers (1022)	281,146	Methyl Ethyl Ketone (78933)	1,215,602
Butyl Alcohol (71363)	239,892	Acetone (67641)	997,327
Hydrogen Fluoride (7664393)	186,226	Sodium Hydroxide (1310732)	823,946
Methanol (67561)	161,344	Zinc Compounds (1039)	697,078
Methyl Eethyl Ketone (78933)	130,739	Butyraldehyde (123728)	573,100
Silica, Crystalline (Respirable, <10 Microns) (1095)	116,812	Phenol (108952)	559,405
Vanadium Compounds (1065)	73,228	Ethylene Glycol (107211)	555,724
Manganese Compounds (1027)	72,473	Dichloromethane (75092)	532,723
Formaldehyde (50000)	66,051	Barium Compounds (1002)	403,604
Methyl Methacrylate (80626)	59,294	Nickel (7440020)	394,193
Nickel Compounds (1029)	54,688	Copper Compounds (1015)	390,611
Styrene Monomer (100425)	53,416	Sulfuric Acid (7664939)	384,978
Butyl Acetate (123864)	51,642	Chromium (7440473)	343,692

Persistent Bioaccumulative Toxic (PBT) Chemicals

2005 was the sixth year TURA facilities reported on chemicals classified as persistent bio-accumulative toxic (PBT) chemicals by the U.S. Environmental Protection Agency (EPA) under the Toxics Release Inventory (TRI) Program.

PBT chemicals are of particular concern because they are highly toxic, remain in the environment for long periods of time, are not readily destroyed, and build up or accumulate in body tissue. Relatively small releases of PBT chemicals can pose human and environmental health threats and, therefore, the use and release of these chemicals, even in relatively small amounts, warrant public reporting as well as efforts to reduce their use and release.

For 2005, Massachusetts facilities reported the use of eight PBT chemicals/chemical categories (see Table 8).[8] No facilities reported the use of tetrabromobisphenol or hexachlorobenzene, both of which had been reported by one facility each in 2003.

It should be noted that TURA data are collected only from facilities within certain industrial sectors that have 10 or more full-time employees, and therefore it does not provide a complete picture of the use and emissions of chemicals, whether PBT or non-PBT chemicals. For instance, TURA data do not include emissions from cars and trucks, or emissions from the majority of releases of pesticides, volatile organic compounds, fertilizers, and many other non-industrial sources. They also do not capture the use of toxic chemicals in consumer products that are not manufactured in Massachusetts.

[8] The amounts in all the PBT tables have been rounded to the nearest pound (to the nearest 0.001 gram for dioxin). As a consequence, the sum of the amounts may be slightly greater or lesser than the totals due to rounding.

Table 8 2005 PBT Summary (in pounds unless otherwise noted)							
PBT Chemical/ Chemical Category	**Reporting Threshold**	**Number of Facilities**	**Total Use**	**Generated as Byproduct**	**Shipped in Product**	**On-Site Releases**	**Transfers Off-Site**
Polycyclic Aromatic Compounds (PACs)	100 lbs.	126	11,123,853	5,639	81,330	939	5,476
Benzo(g,h,i) perylene	10 lbs.	109	128,780	150	2,445	36	82
Mercury	10 lbs.	22	10,444	7,115	4,052	1,449	5,959
Mercury Compounds	10 lbs.	6	1,031	343	172	211	123
Poly-chlorinated biphenyls (PCBs)	10 lbs.	2	21,741	21,733	8	0	21,733
Dioxin and Dioxin-like Compounds	0.1 Grams	17	6,696.330 Grams	6,696.330 Grams	0.000 Grams	560.525 Grams	5,861.316 Grams
Lead	100 lbs.	115	3,711,039	2,822,852	878,088	852,791	1,906,686
Lead Compounds	100 lbs.	125	3,689,271	224,465	3,252,393	9,000	215,214

Polycyclic Aromatic Compounds (PACs) and Benzo(g,h,i)perylene

In 2005, polycyclic aromatic compounds (PACs) and benzo(g,h,i)perylene were the two largest PBT chemical use categories. A total of 126 facilities reported on PACs and 109 reported on benzo(g,h,i)perylene. The primary activity that triggered reporting of these chemicals was combustion of #6 and #4 fuel oils, and to a lesser extent #2 fuel oil. These fuel oils contain PACs and benzo(g,h,i)perylene (i.e., they are already in the fuel that enters a facility's boiler to be combusted to generate heat or steam). Benzo(g,h,i)perylene is an especially toxic polycyclic aromatic compound, and therefore is reported separately from the PACs category and has a lower reporting threshold of 10 pounds (versus a 100 pound reporting threshold for the PACs category). Table 9 shows a breakdown of PACs use and Table 10 shows a breakdown of benzo(g,h,i)perylene use. *Note: While the use of toxics in fuel oil was newly exempt from TURA reporting beginning in 2006 (with the exception of power plants), that chemical use was still reportable for all filers in 2005.*

Table 9 **2005 PACs Summary** **(in pounds)** (Data in parentheses are subtotals)						
Activity / Facility Type	**Number of Facilities**	**Total Use**	**Byproduct**	**Shipped in Product**	**On-site Releases**	**Transfers Off-site**
Fuel Combustion	106	10,986,347	960	89	623	1,614
(Power plants)	*(10)*	*(9,242,274)*	*(816)*	*(0)*	*(456)*	*(1,602)*
(Other Facilities)	*(96)*	*(1,744,074)*	*(144)*	*(89)*	*(i67)*	*(12)*
Waste Oil Processors	3	38,347	3,710	25,297	0	3,710
Asphalt Manufacturers	17	99,159	969	55,944	317	151
Total	**126**	**11,123,853**	**5,639**	**81,330**	**939**	**5,476**

Table 10 **2005 Benzo(g,h,i)perylene Summary** **(in pounds)** (Data in parentheses are subtotals)						
Activity / Facility Type	**Number of Facilities**	**Total Use**	**Byproduct**	**Shipped in Product**	**On-site Releases**	**Transfers Off-site**
Fuel Combustion	92	127,423	96	1,476	36	81
(Power Plants)	*(10)*	*(99,200)*	*(5)*	*(0)*	*(1)*	*(6)*
(Other Facilities)	*(82)*	*(28,223)*	*(91)*	*(1,476)*	*(35)*	*(75)*
Waste Oil Processors	1	308	37	271	0	0
Asphalt Manufacturers	16	1,050	17	698	0	1
Total	**109**	**128,780**	**150**	**2,445**	**36**	**82**

The 10 power plants that reported PACs and the 10 that reported benzo(g,h,i)perylene accounted for 83% of total PACs use and 77% of total benzo(g,h,i)perylene use (9,242,274 pounds and 99,200 pounds, respectively). The other facilities that reported due to fuel combustion accounted for about 16% (1,744,074 pounds) of PAC use and 22% (28,223 pounds) of benzo(g,h,i)perylene use. The majority of facilities

reported zero byproduct generation, on-site releases, and transfers off-site for these chemicals. This is because most PACs and benzo(g,h,i)perylene are destroyed in the combustion process.

Asphalt manufacturers reported total use of 99,159 pounds of PACs and 1,050 pounds of benzo(g,h,i)perylene. Seventeen asphalt manufacturers reported PACs; 16 reported benzo(g,h,i)perylene. Three waste oil processors reported 38,347 pounds of PACs and one waste oil processor reported 308 pounds of benzo(g,h,i)perylene.

Mercury and Mercury Compounds

Twenty-two facilities reported the use of mercury, and six facilities reported the use of mercury compounds. Total use of mercury in 2005 was 10,444. Table 11 shows a breakdown of mercury use by activity.

Municipal waste combustors reported on-site mercury releases of 1,446 pounds, which included 243 pounds in air emissions and 1,203 pounds in ash disposed in lined on-site landfills. The 3,114 pounds of mercury reported as transferred off-site were in ash disposed in lined off-site landfills.

Table 11
2005 Mercury Summary
(in pounds)

Activity / Facility Type	Number of Facilities	Total Use	Byproduct	Shipped in Product	On-Site Releases	Transfers Off-site
Lamp / Ballast Recyclers	2	2,821	7	3,795	2	2
Manufacturers: incorporated mercury into products	2	385	370	47	0	389
Municipal Waste Combustors: combustion of waste with mercury-containing products	7	4,560	4,560	0	1,446	3,114
Concrete manufacturers & Sand and gravel companies: mercury occurs naturally in Portland cement, and is also in coal combustion fly ash that is mixed with concrete.	9	212	2	210	0	0
Manufacturers: used mercury as a processing aid.	2	2,466	2,176	0	0	2,454
Total	**22**	**10,444**	**7,115**	**4,052**	**1,449**	**5,959**

Table 12 shows a breakdown of mercury compounds use. Total mercury compounds use in 2005 was 1,031 pounds. All of the use was due to fuel combustion at power plants. Mercury compounds are found in fuel that is otherwise used to produce power. Mercury compounds also are coincidentally manufactured during combustion. The 172 pounds of mercury compounds shipped in product represents the amount contained in fly ash sold by two utilities.

Table 12 2005 Mercury Compounds Summary (in pounds)						
Activity / Facility Type	**Number of Facilities**	**Total Use**	**Byproduct**	**Shipped in Product**	**On-site Releases**	**Transfers Off-Site**
Power plants: mercury coincidentally generated via combustion	6	1,031	343	172	211	123

Polychlorinated Biphenyls (PCBs)

For 2005, 2 facilities reported the use of polychlorinated biphenyls (PCBs). Table 13 shows the breakdown of PCB use. Nearly 100% of total use of PCBs was attributed to one facility that recycled fluorescent light fixture ballasts and other equipment. This facility also accounted for 100% of byproduct and 100% of transfers off-site of PCBs. The other facility reported the coincidental generation of PCBs in the manufacture of organic pigments, in accordance with EPA's guidance for reporting PCBs.

Table 13 2005 PCBs Summary (in pounds)						
Activity / Facility Type	**Number of Facilities**	**Total Use**	**Byproduct**	**Shipped in Product**	**On-site Releases**	**Transfers Off-site**
Recycler: Lamp / ballast recycling	1	21,733	21,733	0	0	21,733
Manufacturer: coincidentally generates PCBs in manufacture of organic pigments	1	8	0	8	0	0
Total	**2**	**21,741**	**21,733**	8	0	**21,733**

Dioxin and Dioxin-like Compounds

Dioxins are byproducts of chemical and combustion processes, often involving chlorine. Dioxins have poor solubility in water and thus accumulate in body fat and concentrate in the food chain. Because dioxin is considered extremely toxic, EPA established a very low reporting threshold of 0.01 gram.

For 2005, 17 facilities reported the use (i.e., coincidental generation) of dioxin and dioxin-like compounds, including eight power plants, seven municipal waste combustors, and two pulp and paper manufacturers. The municipal waste combustors account for nearly 100% of total use. The combustors reported 549.35 grams of on-site releases of dioxin. Of these releases, 14.95 grams were air emissions and 534.4 grams were in ash disposed in on-site landfills. The 5,860.549 grams of dioxins reported as transferred off-site were in ash disposed in off-site landfills. Two pulp and paper manufacturers also reported dioxin. Table 14 shows the breakdown of dioxin and dioxin-like compounds use.

Table 14 2005 Dioxin and Dioxin-like Compounds Summary (in grams)						
Activity / Facility Type	**Number of Facilities**	**Total Use**	**Byproduct**	**Shipped in Product**	**On-site Releases**	**Trans-fer Off-site**
Power Plants: dioxin coincidentally generated	8	10.619	10.619	0.000	10.952	0.000
Municipal Waste Combustors: dioxin coincidentally generated	7	6,684.400	6,684.400	0.000	549.35	5,860.500
Paper Manufacturers: dioxin coincidentally generated via paper bleaching	2	1.031	1.031	0.000	0 .223	0.767
Total	**17**	**6,696.330**	**6,696.330**	**0.000**	**560.525**	**5,861.316**

Lead and Lead Compounds

For 2005, 115 facilities reported the use of lead and 125 reported the use of lead compounds. The largest use of lead was reported by the municipal waste combustors (2,712,652 or 73% of total lead use). The lead results from combustion of trash and is primarily disposed of as part of ash in lined landfills.

The second largest use of lead (684,239 pounds or 18% of total use) was in the fabricated metals sector , where the metal is used in a variety of applications. This sector processes a variety of ferrous and nonferrous products, such as tools and hardware.

The stone, clay and glass products sector (i.e. asphalt batching plants, cement makers, and sand/gravel companies) represented the largest number of filers (29) as a distinct group. This sector reported a total use of 12,426 pounds or 0.33 % of the total reported for lead. For these companies, lead is an impurity in their raw materials.

Table 15 2005 Lead Summary (in pounds)						
Activity / Facility Type	**Number of Facilities**	**Total Use**	**Byproduct**	**Shipped in Product**	**On-site Releases**	**Transfers Off-site**
Municipal Waste Combustors	7	2,712,652	2,712,652	0	852,156	1,860,523
Fabricated Metals Manufacturers	18	684,239	74,110	613,943	217	67,326
Primary Metals Manufacturers	7	108,499	2,562	105,917	290	2,277
Electronic Equipment Manufacturers	25	120,168	17,859	120,460	36	17,608
Other Industries	58	85,481	15,669	55,768	122	12,953
Total	**115**	**3,711,039**	**2,822,852**	**878,088**	**852,791**	**1,960,686**

The largest reported use of lead compounds was in the wire and cable sector (1,649,748 pounds or 45% of total lead compounds use). In this sector, lead compounds are mostly used as heat stabilizers in the wire insulation.

Twelve facilities in the rubber and plastics accounted for 32% (or 1,195,996 pounds) of the total lead compounds use. In this sector, lead compounds are typically formulated into resins and used as heat stabilizers to protect plastic and rubber polymers from degrading during processing.

Total use of lead compounds declined 1,591,304 pounds from 2004 while transfers off-site fell 20,584 pounds. The wire and cable sector accounted for 35% of the decline total use of lead compounds or a decrease of 887,711 pounds.

Table 16 2005 Lead Compounds Summary (in pounds)						
Activity / Facility Type	**Number of Facilities**	**Total Use**	**Byproduct**	**Shipped in Product**	**On-site Releases**	**Transfers Off-site**
Rubber and Plastics Manufacturers	12	1,195,996	7,359	1,149,591	163	3,203
Wire & Cable Manufacturers	16	1,649,748	87,201	1,477,359	5	96,604
Chemicals & Allied Products	13	435,129	2,321	381,580	693	1,312
Other Industries	84	408,398	127,584	243,863	8,138	114,094
Total	**125**	**3,689,271**	**224,465**	**3,252,393**	**9,000**	**215,214**

IV. 2005 Significant Industrial Sectors

Under TURA, facilities in the Manufacturing Standard Industrial Classification (SIC) codes (20-39 inclusive) and those in SIC codes 10-14, 40, 44-51, 72, 73, 75 and 76, must report their chemical use if they exceed certain thresholds.

Figure 8 shows the number of TURA reporting facilities in each industry sector. The Chemicals and Allied Products sector represents approximately 15% (95 facilities) of the number of TURA reporting facilities, and uses 77% of the reportable TURA chemicals (see Figure 9). This sector is a diverse group of industries, and includes companies that manufacture or formulate adhesives, paints, pharmaceuticals, and plastic materials and resins. Approximately 32% of the total chemical use for this sector was attributable to the use of styrene monomer, which is used in the manufacture of polystyrene and other plastics.

Figure 8 - 2005 Number of Facilities By Industrial Sector
Total Number of Facilities = 615

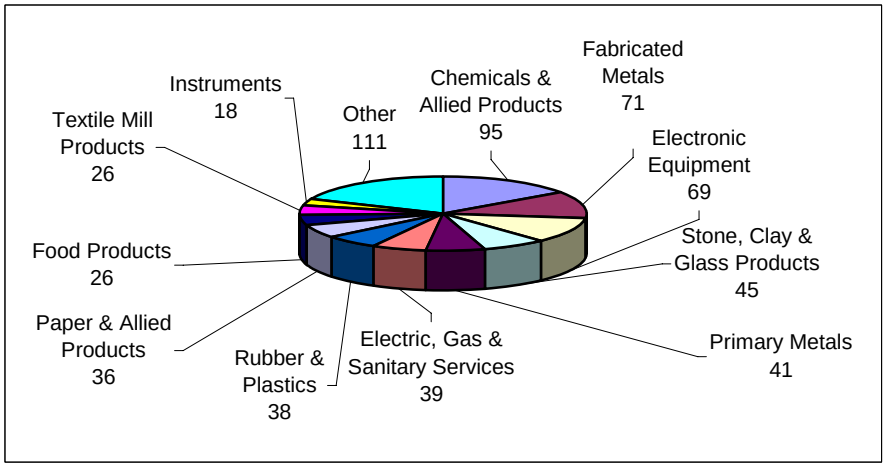
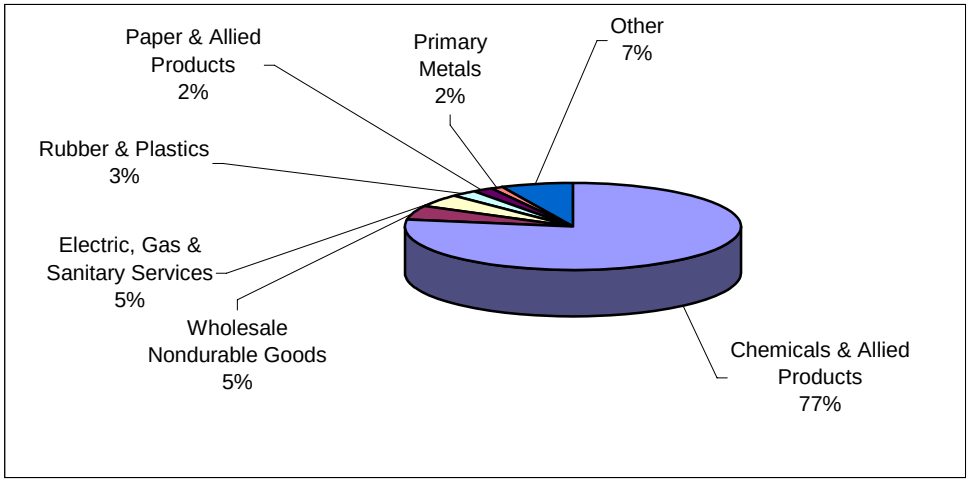


Figure 9 - 2005 Chemical Use By Industrial Sector
Total Use = 1,114,000,000 Pounds



The Wholesale Nondurable Goods and the Electric, Gas and Sanitary Services sectors, the second largest chemical users, each accounted for 5% of total statewide use. The activities of the Wholesale Nondurable Goods sector involve repackaging of chemicals for sale to other sectors. The 41 facilities reporting in the Electric, Gas and Sanitary Services sector are primarily involved in the production of electricity. The Rubber and Plastics sector accounted for 3% of chemical use, and the Paper and Allied Products and Primary Metals sectors each accounted for 2% of chemical use, leaving the balance of statewide use (7%) to a variety of sectors.

Figure 10 shows byproduct generation by industrial sector. While the Chemical and Allied Products sector accounted for 77% of total statewide use, this sector produced 33% of the total byproduct generated in 2005. In contrast, the Paper and Allied Products sector, which accounted for 2% of total statewide chemical use, accounted for 11% of the byproduct generated.

The Electric, Gas and Sanitary Services sector accounted for 12% of total byproduct generated. The Textile Mill Products sector accounted for 10%, and the Rubber and Plastics sector accounted for 8% of the byproduct generated. Other major industries that generated byproduct include the Fabricated Metals sector which accounted for 6%, and the Electronic Equipment sector which accounted for 5% of the byproduct generated. The remaining 15% of byproduct was attributed to a variety of sectors.

Figure 10 - 2005 Byproduct Generation By Industrial Sector
Total Byproduct = 94,000,000 Pounds

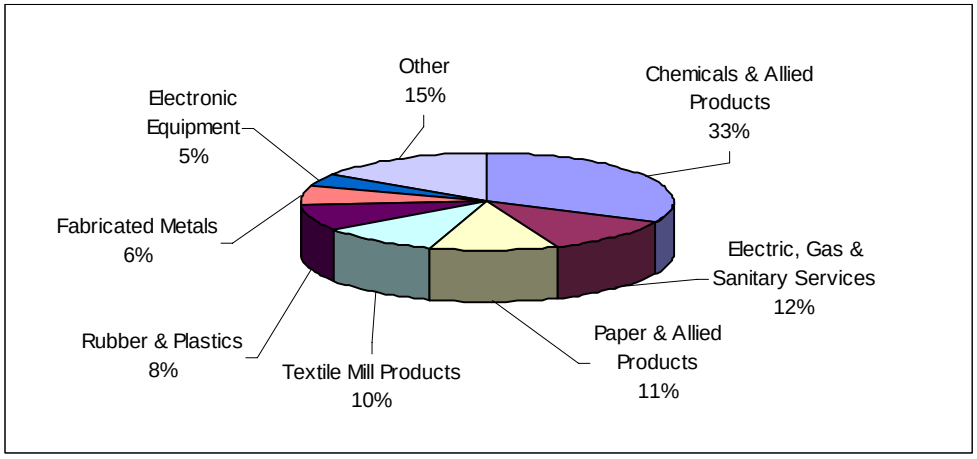


Figure 11 shows on-site releases to the environment by industrial sector. The Electric, Gas and Sanitary Services sector, which represented 5% of total statewide use, was the largest source of on-site releases, accounting for 58% of all on-site releases. This sector provides power for Massachusetts businesses and citizens. Fifty percent of on-site releases in this sector were attributed to the coincidental manufacture of hydrochloric acid during combustion. The Chemicals and Allied Products sector accounted for 77% of total chemical use and only 12% of total on-site releases to the environment. The other major sectors producing on-site releases were the Fabricated Metals sector, which accounted for 7% of total on-site releases, and the Paper and Allied Products and the Textile Mill Products sectors, which each accounted for 4% of total on-site releases. The remaining 15% of on-site releases was attributed to a variety of sectors.

Figure 11 - 2005 On-Site Releases By Industrial Sector
Total On-Site Releases = 9,000,000 Pounds

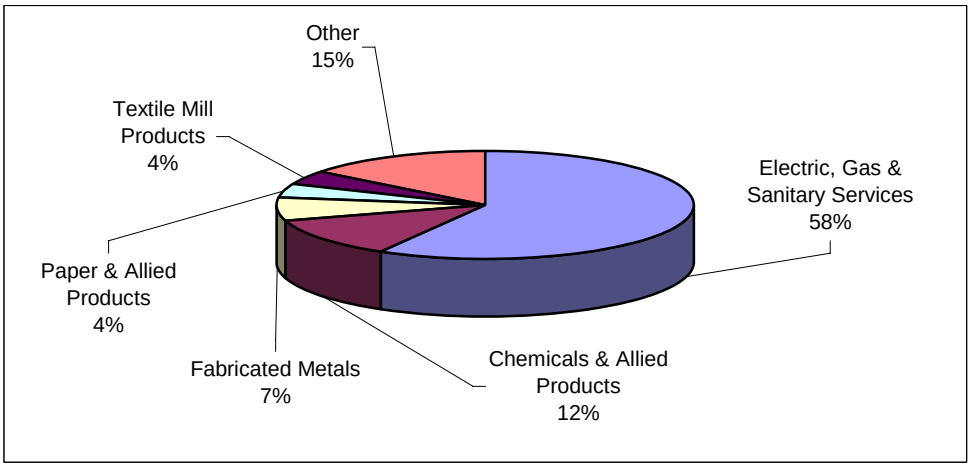
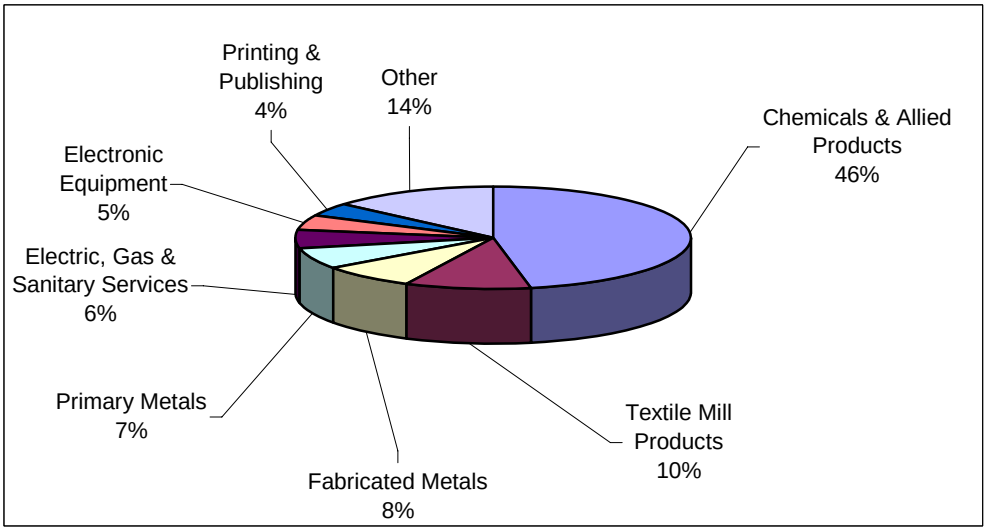


Figure 12 shows transfers off-site by industrial sector. The Chemicals and Allied Products sector accounted for 46% of transfers off-site. The second largest sector in this category, the Textile Mill Products sector, accounted for 10% of total transfers off-site. The third largest sector in this category, the Fabricated Metals sector, accounted for 8% of total transfers off-site. The other major sectors accounting for total transfers off-site were the Primary Metals sector, accounting for 7% of total transfers off-site, the Electric, Gas and Sanitary Services sector, accounting for 6% of total transfers off-site, the Electronic Equipment sector, accounting for 5% of total transfers off-site, and the Printing and Publishing sector, accounting for 4% of total transfers off-site. The remaining 14% of total transfers off-site was attributed to a variety of sectors.

Figure 12 – 2005 Transfers Off-Site By Industrial Sector
Total Transfers Off-Site = 32,000,000 Pounds



V. 2005 Major TURA Facilities

Top 20 Facility Lists

Table 17 lists the 20 facilities that used the largest quantity of TURA chemicals. These 20 facilities used 846 million pounds, or 76% of total statewide use.

Table 17 – 2005 Top 20 Facilities
(Largest Quantity of Total Use)

Total Use *These quantities include Trade Secret*		
Facility Name	**Town**	**Total Use (Lbs.)**
Nova Chemicals Inc.	Springfield	208,694,129
Solutia Inc. - Indian Orchard Plant	Springfield	111,323,434
Borden & Remington	Fall River	107,503,587
American Polymers	Oxford	65,713,962
Holland Company Inc.	Adams	49,833,900
Eastman Gelatine Corp.	Peabody	43,840,894
Ineos Melamines	Springfield	41,532,950
Astro Chemicals Inc.	Springfield	31,107,949
North Win LTD	Leominster	22,670,271
Fox Packaging Co.	Ayer	21,831,646
James Austin Co.	Ludlow	21,329,668
Houghton Chemical Corp.	Boston	18,271,821
Ashland Distribution Co.	Tewksbury	18,228,882
Cytec Surface Specialties	Springfield	15,533,159
Semass Partnership	Rochester	13,826,689
ITW TACC	Rockland	12,908,632
Omnova Solutions Inc.	Fitchburg	12,351,800
Mirant Canal LLC	Sandwich	10,979,158
Hercules Inc.	Chicopee	10,185,632
Leggett & Platt Inc.	Newburyport	7,882,547

Table 18 lists the 20 facilities that generated the largest quantity of byproduct. These facilities generated 52 million pounds of byproduct, or 55% of total statewide byproduct. Table 18 also lists the 20 facilities with the largest quantity shipped in product. These facilities shipped 346 million pounds in product, or 84% of total shipped in product statewide.

Table 18 - 2005 Top 20 Facilities
(Largest Quantity of Byproduct Generation and Shipped in Product)

Byproduct Generation *These quantities include Trade Secret*			**Shipped in Product** *These quantities include Trade Secret*		
Facility Name	**Town**	**Byproduct Generation (Lbs.)**	**Facility Name**	**Town**	**Shipped in Product (Lbs.)**
Eastman Gelatine Corp.	Peabody	8,473,987	Borden & Remington	Fall River	107,496,747
Flexcon Co Inc. Plant 2	Spencer	5,444,029	Solutia Inc. Indian Orchard Plant	Springfield	34,009,714
Solutia Inc. Indian Orchard Plant	Springfield	5,213,611	Astro Chemicals Inc.	Springfield	29,043,422
Venture Tape	Rockland	4,186,436	North Win LTD	Leominster	22,664,299
Ineos Melamines	Springfield	4,090,018	Fox Packaging Co.	Ayer	21,827,931
Mirant Canal LLC	Sandwich	2,761,497	James Austin Co.	Ludlow	21,266,481
Precision Lithograining Corp.	South Hadley	2,143,821	Ashland Distribution Co.	Tewksbury	19,687,002
Bostik Findley Inc.	Middleton	2,081,225	Houghton Chemical Corp.	Boston	18,255,111
Chemdesign Corp.	Fitchburg	1,817,820	Holland Company Inc.	Adams	15,898,400
Madico Inc.	Woburn	1,741,236	ITW TACC	Rockland	12,610,160
Dominion Energy Brayton Point LLC	Somerset	1,700,167	Cytec Surface Specialties	Springfield	6,833,427
Crane & Co Inc. Pioneer Mill	Dalton	1,674,171	Webco Chemical Corp.	Dudley	6,289,116
Intelicoat Technologies Inc.	South Hadley	1,645,087	Rohm & Haas Electronics Materials LLC	Marlborough	5,238,711
Intel Corp.	Hudson	1,526,204	Callahan Company	Walpole	4,910,132
Bradford Industries	Lowell	1,427,073	Top-Flite Golf Co.	Chicopee	4,217,760
Cytec Surface Specialties	Springfield	1,339,553	Advance Coatings Co.	Westminster	3,845,644
Ideal Tape Company	Lowell	1,334,128	Alphagary	Leominster	3,486,634
Semass Partnership	Rochester	1,088,768	Surface Coatings	Wilmington	3,368,131
ITW Foilmark Inc.	Newburyport	1,039,739	ITW Devcon Plexus	Danvers	2,853,028
Fiberweb Simpsonville Inc.	Colrain	1,029,255	Bostik Findley Inc.	Middleton	2,524,910

Table 19 lists the 20 facilities that had the largest quantity of on-site releases and also lists the 20 facilities that had the largest quantity of transfers off-site. The 20 facilities with the largest quantity of on-site releases released 6 million pounds, or 75% of total releases statewide. Seven of these facilities were power plants, accounting for 3.5 million pounds, or 41% of total on-site releases. Two million pounds, or 59% of the power plants' on-site releases, were due to the coincidental manufacture of hydrochloric acid during combustion. The remainder of the power plants' on-site releases was due to the coincidental manufacture of the following chemicals during combustion: sulfuric acid (14%), ammonia (12%), metal compounds (8%), and hydrogen fluoride (5%). Five of the Top 20 facilities were municipal waste combustors (MWCs) that reported combustion-related emissions. Of the 1.6 million pounds of on-site releases reported by MWCs, 46% of the releases was due to the coincidental manufacture of hydrochloric acid during combustion and 54% was due to lead in ash disposed in on-site lined landfills at two of the facilities.

The 20 facilities with the largest quantity of transfers off-site transferred 20 million pounds, or 61% of the total transfers off-site statewide.

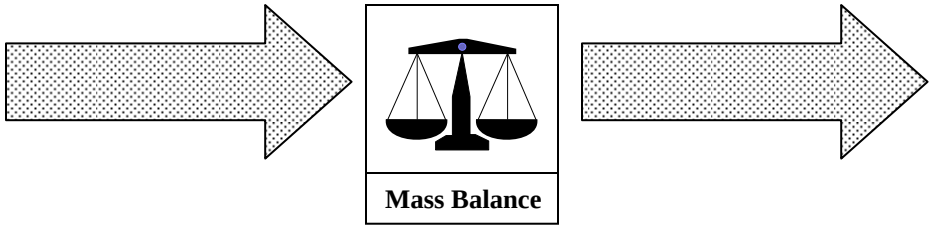
Table 19 – 2005 Top 20 Facilities
(Largest Quantity of On-Site Releases and Transfers Off-Site)

On-Site Releases *These quantities include Trade Secret*			**Transfers Off-Site** *These quantities include Trade Secret*		
Facility Name	**Town**	**On-Site Releases (Lbs.)**	**Facility Name**	**Town**	**Transfers Off-Site (Lbs.)**
Dominion Energy Brayton Point LLC	Somerset	1,421,309	Ineos Melamines	Springfield	3,668,055
Wheelabrator Saugus JV	Saugus	543,061	Solutia Inc. Indian Orchard Plant	Springfield	3,645,569
Dominion Energy Salem Harbor LLC	Salem	526,841	Chemdesign Corp.	Fitchburg	1,617,604
Mirant Canal LLC	Sandwich	495,597	Cytec Surface Specialties	Springfield	1,211,353
Covanta Haverhill Inc	Haverhill	444,605	Ideal Tape Co.	Lowell	1,126,075
Crown Beverage Packaging USA	Lawrence	404,780	Lewcott Corp.	Millbury	1,007,528
Somerset Power LLC	Somerset	385,933	Semass Partnership	Rochester	794,125
Solutia Inc. Indian Orchard Plant	Springfield	316,266	Precision Lithograining Corp.	South Hadley	761,299
Mt. Tom Generating Co. LLC	Holyoke	313,734	Engineered Materials Solutions Inc.	Attleboro	739,217
Semass Partnership	Rochester	294,644	Waters Corp.	Taunton	639,504
Boston Generating Mystic LLC	Charlestown	258,215	Intel Corp.	Hudson	635,582
Alliance Leather Inc.	Peabody	163,179	Polaroid Corp. DBA	Waltham	605,990
Ideal Tape Co.	Lowell	156,934	Intelicoat Technologies Inc.	South Hadley	539,940
Wheelabrator Millbury Inc.	Millbury	134,004	Brittany Dyeing & Printing Corp.	New Bedford	512,028
Wheelabrator North Andover Inc.	North Andover	127,962	Wheelabrator Millbury Inc.	Millbury	436,361
Rodney Hunt Co.	Orange	118,328	Flexcon Co Inc. Plant 2	Spencer	433,570
Hollingsworth & Vose Co.	West Groton	97,718	Wheelabrator North Andover Inc.	North Andover	384,507
Trigen Boston Energy Corp.	Boston	92,933	Koch Membrane Sytems Inc.	Wilmington	378,473
Venture Tape	Rockland	83,310	Haartz Corp.	Acton	331,482
Top-Flite Golf Co.	Chicopee	71,759	The Duncan Group	Everett	311,520

This section contains definitions of key TURA terms.

TURA – Massachusetts Toxics Use Reduction Act of 1989 (MGL 21I)
TRI – federal EPA Toxics Release Inventory
TRADE SECRET – the information identified as confidential by TURA filers. To protect confidentiality claims by Trade Secret filers, all trade secret data in this information release are presented in aggregated form. Aggregated data do not include the names and amounts of chemicals subject to claims of confidentiality.
2000 CORE GROUP – includes all industry categories and chemicals that were subject to TURA reporting in 2000 and remained subject to reporting in 2005. The 2000 Core Group is used to measure progress from 2000 to 2005.
1990 CORE GROUP – includes all industry categories and chemicals that were subject to TURA reporting in 1990 and remained subject to reporting in 2005. The 1990 Core Group is used to measure progress from 1990 to 2005.

The terms and definitions below have been arranged in order of inputs and outputs. Chemicals that are used by companies are brought into the facility and are manufactured, processed or otherwise used. As a result of using these chemicals, a company has outputs that can include a product that is created for sale, or a byproduct or waste. The calculation of use and waste of chemicals is known as 'mass balance.' Generally the inputs equal the outputs, but there are circumstances where a chemical is used in ways that result in an imbalance between inputs and outputs. These circumstances are most often the result of: 1) chemicals are recycled on-site, 2) the product was held in inventory, 3) chemical is consumed or transformed, or 4) the chemical is a compound.



TOTAL USE – the total quantity in pounds of TURA chemicals reported as manufactured, processed and otherwise used.

MANUFACTURE – to produce, prepare, import or compound a toxic or hazardous substance.

OTHERWISE USE – any use of a toxic substance that is not covered by the terms "manufacture" or "process" and includes use of a toxic substance contained in a mixture or trade name product.

PROCESS – the preparation of a toxic or hazardous substance, including without limitation, a toxic substance contained in a mixture or trade name product, after its manufacture, for distribution in commerce: a) in the same form or physical state, or in a different form or physical state, from that in which it was received by the toxics user so preparing such substance; or b) as part of an article containing the toxic or hazardous substance.

PRODUCT – a product, a family of products, an intermediate product, family of intermediate products, or a desired result or a family of results. "Product" also means a byproduct that is used as a raw material without treatment.

SHIPPED IN PRODUCT – the quantity in pounds of the chemical that leaves the facility as product.

BYPRODUCT – all non-product outputs of reportable substances generated by a production unit prior to handling, treatment, and release.

ON-SITE RELEASES– all byproducts that are released to the air, discharged to surface waters, released to land and underground injection wells.

TRANSFERS OFF-SITE – byproducts that are transferred off-site for energy recovery, recycling, treatment and disposal.

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