2008 SECTOR PERFORMANCE REPORT

Supplement

February 2009

*Updated to include 2006 TRI data

SectorStrategies

EPA
United States
Environmental Protection
Agency

Welcome to U.S. Environmental Protection Agency's (EPA) February 2009 Supplement to the *2008 Sector Performance Report*. To provide readers with the most recent environmental performance information on the sectors we cover, we plan to periodically publish updated Supplements to our *Report* as new data become available. This first Supplement provides updated Toxics Release Inventory (TRI) data from 2006. As this Supplement is a companion to the *2008 Sector Performance Report,* rather than a stand-alone report, the data and text presented in the *Report* are not repeated in this document. Instead, we refer the reader to the *2008 Sector Performance Report* (www.epa.gov/sectors/performance.html) for important information on background, context, and methods.

INTRODUCTION

LATEST ENVIRONMENTAL STATISTICS[1]

for sectors presented in this Supplement

Releases of Chemicals Reported to 2006 TRI:	1.3 billion lbs
Air Emissions (TRI)	*480.5 million lbs*
Water Discharges (TRI)	*158.2 million lbs*
Waste Disposals (TRI)	*683.3 million lbs*
Recycling, Energy Recovery, or Treatment Reported to 2006 TRI:	14.7 billion lbs

The data discussed in this Supplement are drawn from U.S. EPA's 2006 Toxics Release Inventory (TRI). See the *Data Guide* and the *Data Sources, Methodologies, and Considerations* chapter in the *2008 Sector Performance Report* (www.epa.gov/sectors/ performance.html) for important information and qualifications about how data are generated, synthesized, and presented.

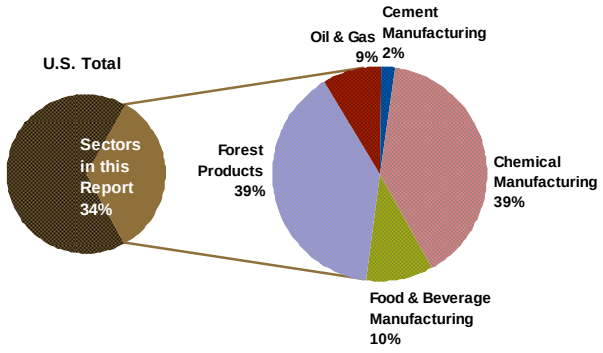
2006 TRI Overview

This Supplement presents updated data for the sectors we cover that report to EPA's Toxics Release Inventory (TRI). Updated data were obtained from the 2006 TRI Public Data Release. Please refer to the *Data Guide* and the *Data Sources, Methodologies, and Considerations* sections of the 2008 *Sector Performance Report* for important information and qualifications about how these data are generated, synthesized and presented.

Air Emissions Reported to TRI

In 2006, the 9 of our 12 sectors that report to TRI reported emitting 480.5 million lbs. of TRI chemicals, out of 1.4 billion lbs. emitted by all TRI reporters nationwide. For all but two sectors, absolute emissions of hazardous air pollutants (HAPs) accounted for 50% or more of the total air emissions. From 1997 to 2006, normalized total air emissions and normalized HAP emissions declined for all sectors. See individual sector chapters for sector-specific data. The pie chart below presents the relative TRI air emissions for the Sector Strategies sectors (sectors accounting for 1% or less have not been included).

TRI Air Emissions 2006

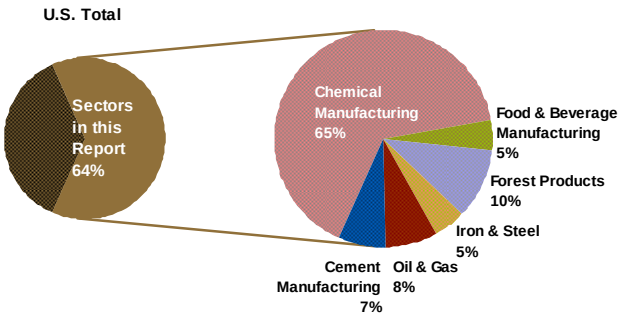


Source: U.S. Environmental Protection Agency

Waste Management Reported to TRI

In 2006, the nine sectors reported managing 16 billion absolute lbs. of TRI chemicals as waste. The pie chart below presents the relative quantities of TRI waste managed by the Sector Strategies sectors (sectors accounting for 1% or less have not been included). When normalized (by annual sector shipments, revenue, or production), total waste managed declined 20% between 1997 and 2006. In 2006, 8% of the TRI-reported waste by these nine sectors was disposed or released, 37% was treated, 33% was recycled, and 22% was recovered for energy.

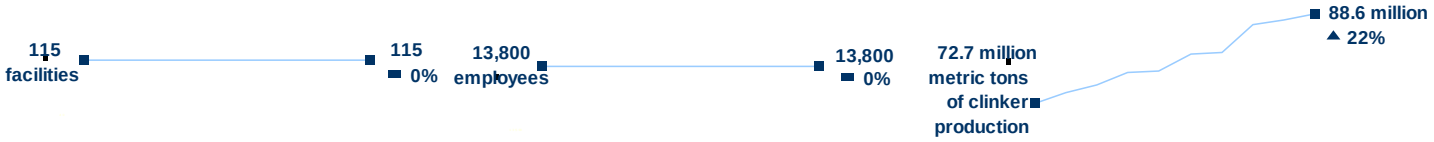
TRI Waste Management 2006



Source: U.S. Environmental Protection Agency

CEMENT MANUFACTURING

AT A GLANCE 1997-2006[1]



LATEST ENVIRONMENTAL STATISTICS[2]

Releases of Chemicals Reported to 2006 TRI: 10.9 million lbs

Air Emissions: 8.8 million lbs

Water Discharges: 3,100 lbs

Waste Disposals: 2.1 million lbs

Recycling, Energy Recovery, or Treatment: 1.1 billion lbs

The data discussed in this Supplement are drawn from U.S. EPA's 2006 Toxics Release Inventory (TRI). See the Data Guide *and the* Data Sources, Methodologies, and Considerations *chapter in the* 2008 Sector Performance Report *for important information and qualifications about how data are generated, synthesized, and presented. The* 2008 Sector Performance Report *is available at: http://www.epa.gov/sectors/performance.html.*

Air Emissions

Air Emissions Reported to TRI

In 2006, 108 facilities in the sector reported 8.8 million absolute lbs. of air emissions to EPA's TRI. The absolute pounds emitted annually presented no overall change from 1997, as show in Figure 2a, but when normalized by annual clinker production, the sector's TRI air emissions decreased by 18% over the same period, as shown in Figure 2b. The decrease from 2005 to 2006 is due to a decline in the quantity of several chemicals emitted to air by the sector, including ethylene, propylene, benzene, ammonia, and sulfuric acid.

Summing the Toxicity Scores for all of the air emissions reported to TRI by the sector produces the trend illustrated in Figure 2c. The sector's Toxicity Scores fluctuated from 1997 to 2006, with an overall increase of 8% when normalized by clinker production. Important methodological considerations regarding Toxicity Scores are discussed in the *2008 Sector Performance Report's* Data Guide, which explains the underlying assumptions and limitations of Toxicity Scores.

In absolute pounds, HAPs accounted for 57% of the sector's air emissions reported to TRI in 2006, and 48% of the overall Toxicity Score.

Table 1 presents the sector's top TRI-reported air emissions based on three indicators.

TABLE 1

Top TRI Air Emissions 2006

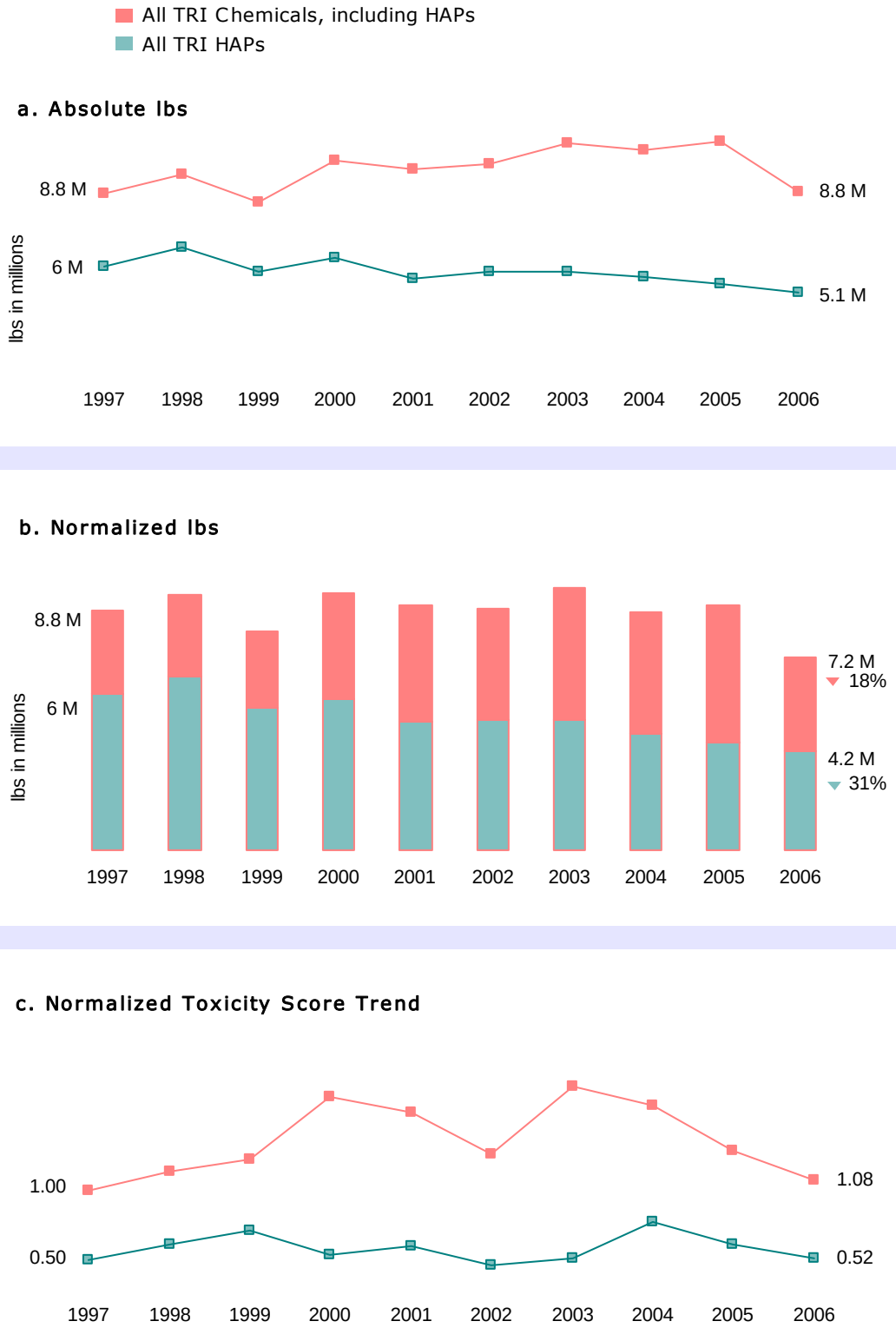
Chemical	Absolute Pounds Reported[1]	Percentage of Toxicity Score	Number of Facilities Reporting[2]
Ammonia	1,105,000[3]	<1%	17
Benzene[4]	425,000	1%	15
Chlorine	54,000	10%	1
Chromium	6,000	1%[5]	55
Dioxin and Dioxin-Like Compounds	<1	<1%	76
Ethylene	984,000	<1%	1
Hydrochloric Acid	4,113,000	8%	39
Lead	21,000	4%	106
Manganese	25,000	19%	33
Mercury	11,000	1%	101
Sulfuric Acid	1,305,000	51%	11
Percentage of Sector Total	**91%**[6]	**96%**[7]	**100%**[8]

Notes:
1. Total reported sector air releases: 8.8 million lbs.
2. 108 total TRI reporters in the sector.
3. Red indicates that the chemical was one of the top five chemicals reported in the given category.
4. *Italics* indicate a hazardous air pollutant under section 112 of Clean Air Act.
5. Based on chromium speciation data for this sector from EPA's National Emissions Inventory, chromium Toxicity Scores were adjusted to assume that 8% was hexavalent and 92% was trivalent.
6. Chemicals in this list represent 91% of the sector's air emissions.
7. Chemicals in this list represent 96% of the sector's Toxicity Score.
8. 100% of facilities reported emitting one of more chemicals in this list.

Source: U.S. Environmental Protection Agency

FIGURE 2

Air Emissions Reported to TRI 1997-2006



Note:
Normalized by annual clinker production.

Sources: U.S. Environmental Protection Agency, U.S. Geological Survey

Waste Generation and Management

Waste Management Reported to TRI

In 2006, the Cement Manufacturing sector reported managing 1.1 billion absolute lbs. of TRI chemicals as waste. As shown by the trend in Figure 4, when normalized by annual clinker production, the quantity of waste managed decreased by 36% from 1997 until 2005, followed by a 150% increase from 2005 to 2006. The increase was primarily driven by an increase in the reported quantity of ethylene glycol recovered by a single facility. The facility reported ethylene glycol recovery averaging 3.2 million lbs. from 2003 to 2005, and 729.9 million lbs. (accounting for 68% of the sectors overall waste managed) in 2006. For all of the years presented, energy recovery was the predominant method used by this sector for managing TRI chemicals.

In 2006, the sector reported disposing 2.1 million lbs. of TRI chemicals to land or transferring the chemicals to offsite locations for disposal. As shown in Table 3, metals dominated the sector's TRI disposals.

TABLE 3

Top TRI Disposals 2006

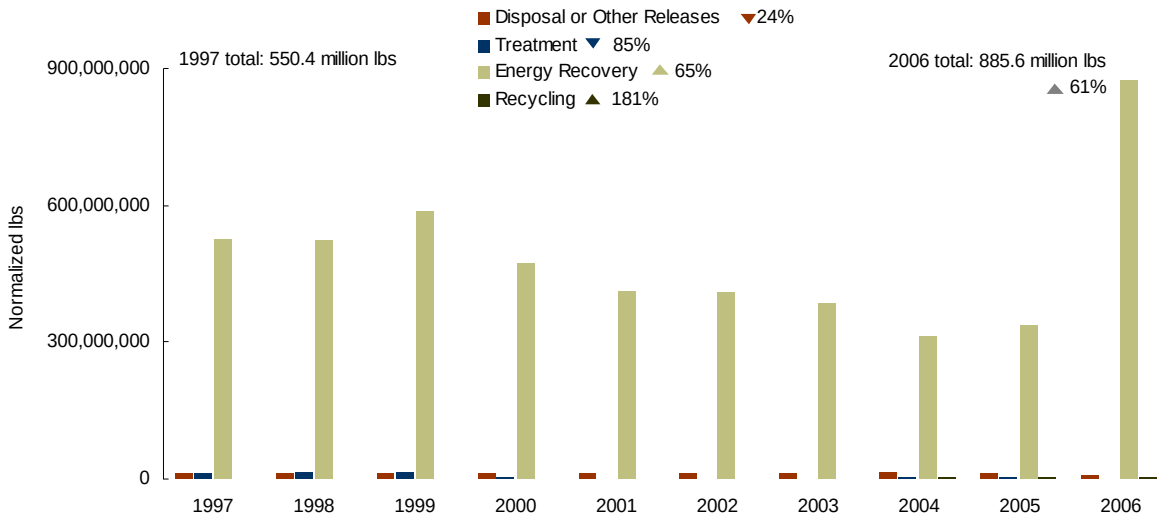
Chemical	Absolute Pounds Reported[1]	Number of Facilities Reporting[2]
Barium	174,100[3]	11
Chromium	84,200	25
Lead	558,100	46
Manganese	731,200	17
Mercury	1,100	39
Zinc	324,100	15
Percentage of Sector Total	**91%[4]**	**45%[5]**

Notes:
1. Total reported sector disposals: 2.1 million lbs.
2. 108 total TRI reporters in the sector.
3. Red indicates that the chemical was one of the top five chemicals reported in the given category.
4. Chemicals in this list represent 91% of the sector's disposals.
5. 45% of facilities reported emitting one of more chemicals in this list.

Source: U.S. Environmental Protection Agency

FIGURE 4

TRI Waste Management 1997-2006

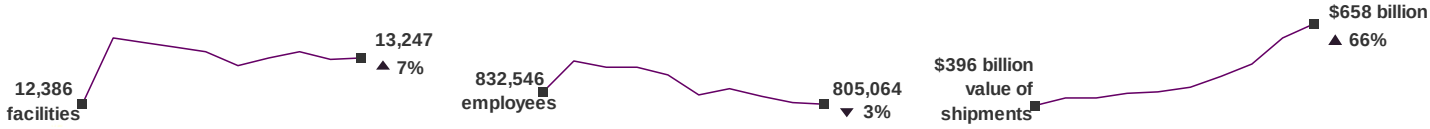


Notes:
1. Normalized by annual clinker production.
2. Disposal or other releases include air releases, water discharges, and land disposals.

Sources: U.S. Environmental Protection Agency, U.S. Geological Survey

CHEMICAL MANUFACTURING

AT A GLANCE 1997-2006[1]



Note:
U.S. DOC has revised the sector's 2005 VOS from $555 billion (as presented in the 2008 SPR) to $611billion.

LATEST ENVIRONMENTAL STATISTICS[2]

Releases of Chemicals Reported to 2006 TRI: 519.2 million lbs

Air Emissions: 187 million lbs

Water Discharges: 37.5 million lbs

Waste Disposals: 294.8 million lbs

Recycling, Energy Recovery, or Treatment: 9.8 billion lbs

The data discussed in this Supplement are drawn from U.S. EPA's 2006 Toxics Release Inventory (TRI). See the Data Guide *and the* Data Sources, Methodologies, and Considerations *chapter in the* 2008 Sector Performance Report *for important information and qualifications about how data are generated, synthesized, and presented. The* 2008 Sector Performance Report *is available at: http://www.epa.gov/sectors/performance.html.*

Air Emissions

Air Emissions Reported to TRI

In 2006, 3,192 facilities in the Chemical Manufacturing sector reported 187 million absolute lbs. of air emissions. Between 1997 and 2006, absolute TRI-reported air emissions declined by 49%, as shown in Figure 2a. When normalized by the sector's value of shipments (VOS) over the period, air emissions decreased 62%, as seen in Figure 2b. Summing the Toxicity Scores for all of the air emissions reported to TRI by the sector produces the trend illustrated in Figure 2c. The sector's normalized Toxicity Score decreased by 52% from 1997 to 2006.

In absolute pounds, HAPs accounted for 50% of the sector's air emissions reported to TRI in 2006, and 71% of the overall Toxicity Score. Trends in emissions of HAPs, based on pounds and on the Toxicity Scores, showed very similar declines to the trends in air emissions for all TRI chemicals. Important methodological considerations regarding Toxicity Scores are discussed in the *2008 Sector Performance Report's* Data Guide, which explains the underlying assumptions and limitations of Toxicity Scores.

Table 1 presents the sector's top TRI-reported chemicals emitted to air by the sector based on three indicators.

TABLE 1

Top TRI Air Emissions 2006

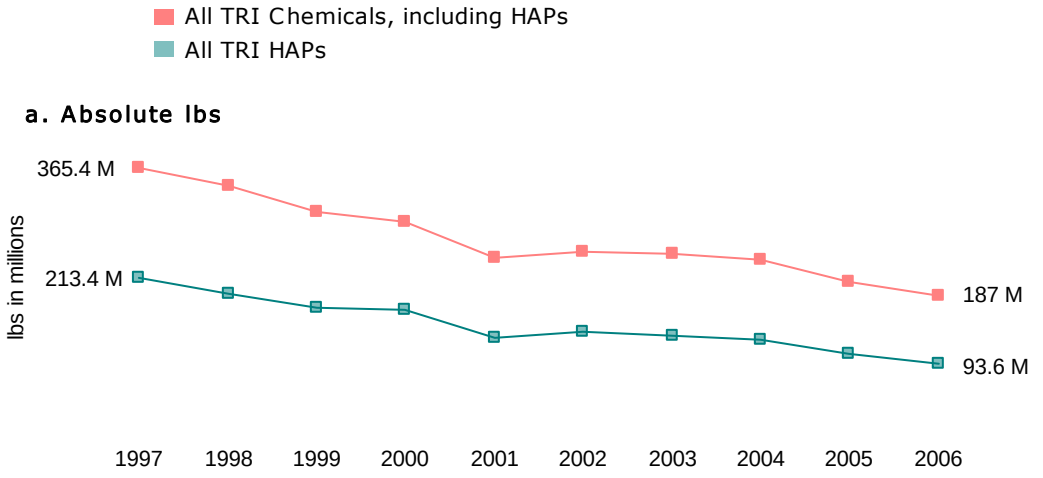
Chemical	Absolute Pounds Reported[1]	Percentage of Toxicity Score	Number of Facilities Reporting[2]
Acrolein[3]	49,000	9%[4]	36
Ammonia	46,870,000	2%	580
Carbonyl Sulfide	13,335,000	4%	34
Certain Glycol Ethers	634,000	<1%	424
Chlorine	1,125,000	21%	271
Diisocyanates	14,000	5%[5]	83
Ethylene	16,424,000	<1%	138
Manganese	116,000	9%	78
Methanol	16,834,000	<1%	770
Propylene	8,287,000	<1%	114
Sulfuric Acid	4,039,000	15%	109
Toluene	6,131,000	<1%	663
Xylene	2,685,000	<1%	556
Percentage of Sector Total	**62%**[6]	**65%**[7]	**62%**[8]

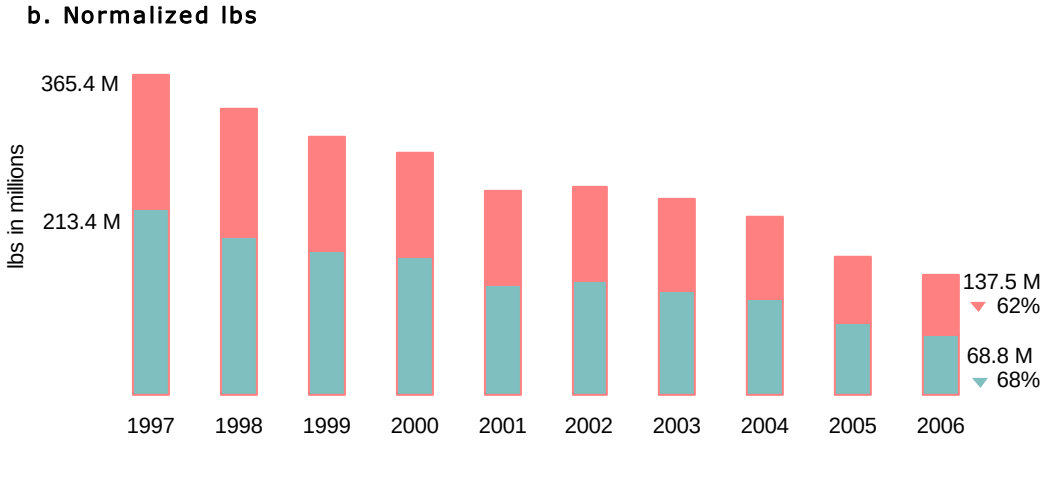
Notes:
1. Total reported sector air releases: 187.0 million lbs.
2. 3,192 total TRI reporters in the sector.
3. *Italics* indicate a hazardous air pollutant under section 112 of Clean Air Act.
4. Red indicates that the chemical was one of the top five chemicals reported in the given category.
5. Calculation of Toxicity Score for diisocyanates conservatively assumed that all diisocyanates emissions were hexamethylene-1,6-diisocyanates. Other diisocyanates chemicals with lower toxicity scores may constitute the majority of reported diisocyanates emissions from the sector. Thus, RSEI analyses may overestimate the relative harmfulness of diisocyanates emissions.
6. Chemicals in this list represent 62% of the sector's air emissions.
7. Chemicals in this list represent 65% of the sector's Toxicity Score.
8. 62% of facilities reported emitting one of more chemicals in this list.

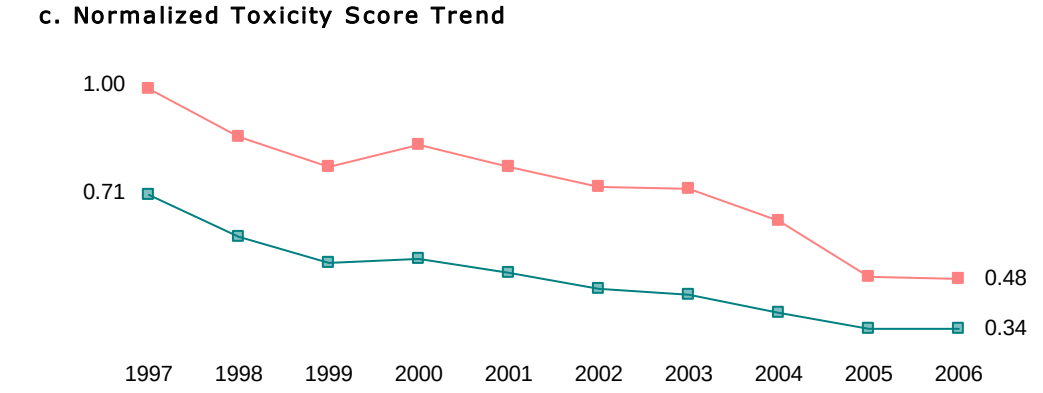
Source: U.S. Environmental Protection Agency

FIGURE 2

Air Emissions Reported to TRI 1997-2006







Note:
Normalized by annual value of shipments.

Sources: U.S. Environmental Protection Agency, U.S. Department of Commerce

Waste Generation and Management

Waste Management Reported to TRI

In 2006, chemical manufacturers reported managing 10.4 billion absolute lbs. of TRI chemicals as waste. When normalized by the sector's VOS, this was 34% less than 1997. Figure 3 shows how the sector managed this waste. In 2006, 5% of the TRI-reported waste was released or disposed. Most of the waste disposed in 2006 went to underground injection wells. In the same year, 15% was recovered for energy use, 38% was treated, and 42% was recycled. When normalized by VOS between 1997 and 2006, the quantity of waste managed by each individual method (e.g., treated, disposed) decreased.

For the overall sector, manganese and nitrate compounds were disposed in the greatest quantities and accounted for one-third of disposals, while lead and zinc were the most frequently reported chemicals disposed, as indicated in Table 3.

TABLE 3

Top TRI Disposals 2006

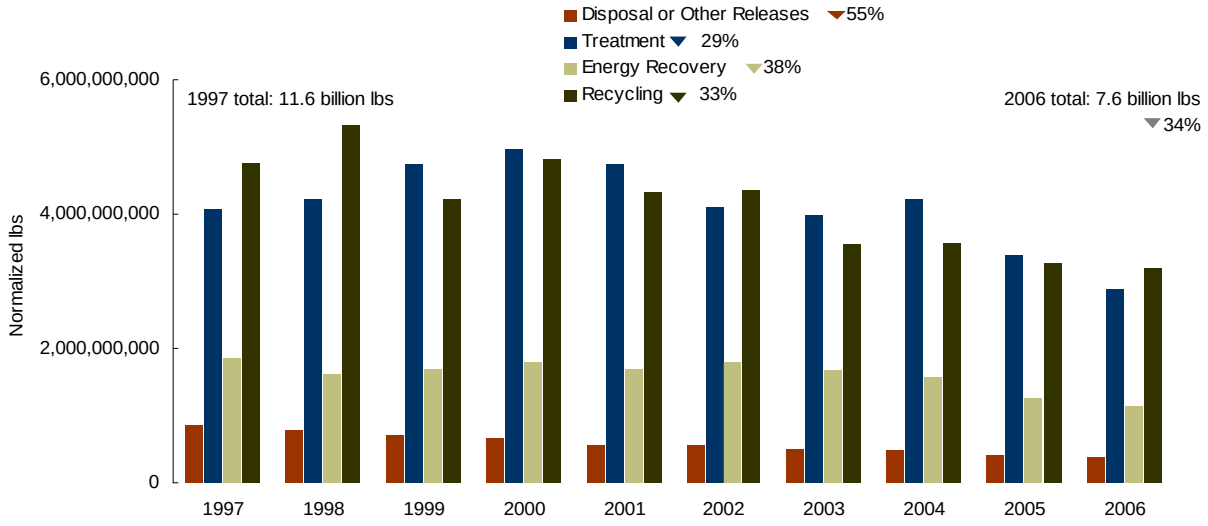
Chemical	Absolute Pounds Reported[1]	Number of Facilities Reporting[2]
Acetonitrile	14,625,000[3]	21
Ammonia	30,554,000	163
Copper	3,174,000	146
Lead	2,478,000	402
Manganese	53,625,000	83
Methanol	23,309,000	148
Nitrate Compounds	44,003,000	94
Zinc	7,357,000	382
Percentage of Sector Total	**60%[4]**	**28%[5]**

Notes:
1. Total reported sector disposals: 294.8 million lbs.
2. 3,192 total TRI reporters in the sector.
3. Red indicates that the chemical was one of the top five chemicals reported in the given category.
4. Chemicals in this list represent 60% of the sector's disposals.
5. 28% of facilities reported emitting one of more chemicals in this list.

Source: U.S. Environmental Protection Agency

FIGURE 3

TRI Waste Management 1997-2006



Notes:
1. Normalized by annual value of shipments.
2. Disposal or other releases include air releases, water discharges, and land disposals.

Sources: U.S. Environmental Protection Agency, U.S. Department of Commerce

FOOD & BEVERAGE MANUFACTURING

AT A GLANCE 1997-2006[1]

LATEST ENVIRONMENTAL STATISTICS[2]

Releases of Chemicals Reported to 2006 TRI: 150.1 million lbs

Air Emissions: 47 million lbs

Water Discharges: 77.3 million lbs

Waste Disposals: 25.9 million lbs

Recycling, Energy Recovery, or Treatment: 590.7 million lbs

The data discussed in this Supplement are drawn from U.S. EPA's 2006 Toxics Release Inventory (TRI). See the Data Guide *and the* Data Sources, Methodologies, and Considerations *chapter in the* 2008 Sector Performance Report *for important information and qualifications about how data are generated, synthesized, and presented. The* 2008 Sector Performance Report *is available at: http://www.epa.gov/sectors/performance.html.*

Air Emissions

Air Emissions Reported to TRI

In 2006, 1,120 facilities in the sector reported 47 million absolute lbs. of air emissions. HAPs accounted for 70% of these emissions. Between 1997 and 2006, absolute TRI-reported air emissions declined by 39%, as show in Figure 2a. As shown in Figure 2b, when normalized by the value of shipments (VOS), air emissions decreased 41%.

Summing the Toxicity Scores for all of the air emissions reported to TRI by the sector produces the trend illustrated in Figure 2c. The sector's Toxicity Scores increased by 53% from 1997 to 2006 when normalized by the sector's annual VOS. Important methodological considerations regarding Toxicity Scores are discussed in the *2008 Sector Performance Report's* Data Guide, which explains the underlying assumptions and limitations of Toxicity Scores.

Table 1 presents the top TRI-reported chemicals emitted to air by the sector based on three indicators.

TABLE 1

Top TRI Air Emissions 2006

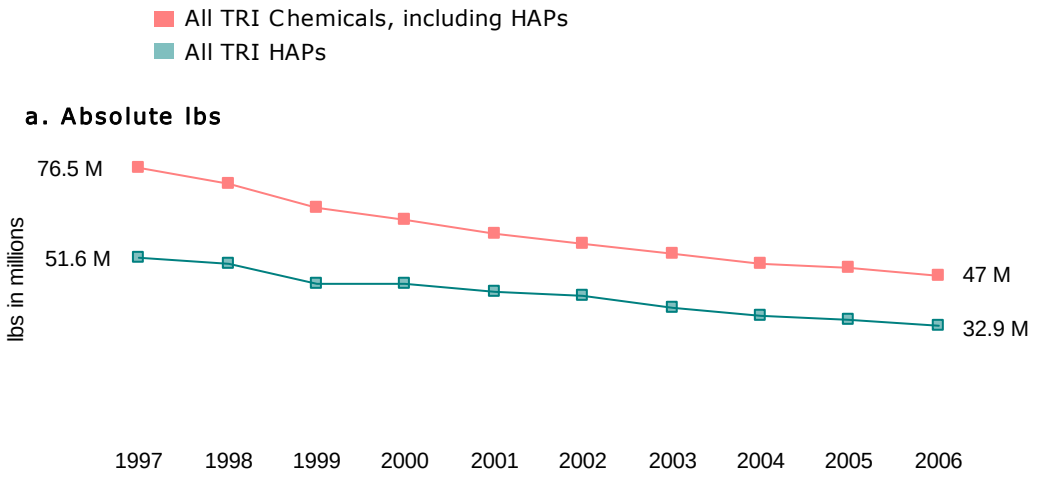
Chemical	Absolute Pounds Reported[1]	Percentage of Toxicity Score	Number of Facilities Reporting[2]
Acetaldehyde[3]	1,716,000	4%[4]	22
Acrolein	28,000	30%	2
Ammonia	11,628,000	2%	357
Hydrochloric Acid	5,389,000	6%	41
Lead	34,000	3%	67
Methanol	2,497,000	<1%	47
N-Hexane	21,264,000	1%	85
Polycyclic Aromatic Compounds	35,000	6%	46
Sulfuric Acid	1,730,000	36%	23
Percentage of Sector Total	**94%**[5]	**88%**[6]	**46%**[7]

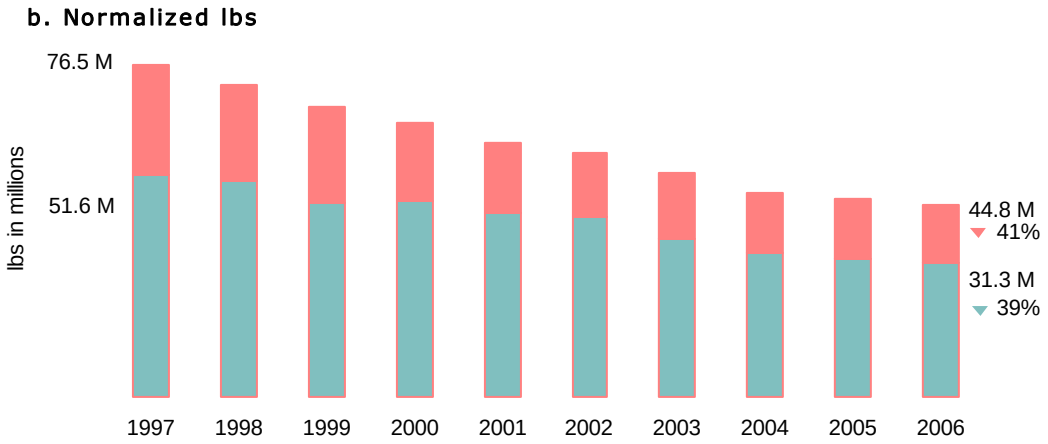
Notes:
1. Total reported sector air releases: 47.0 million lbs.
2. 1,120 total TRI reporters in the sector.
3. *Italics* indicate a hazardous air pollutant under section 112 of Clean Air Act.
4. Red indicates that the chemical was one of the top five chemicals reported in the given category.
5. Chemicals in this list represent 94% of the sector's air emissions.
6. Chemicals in this list represent 88% of the sector's Toxicity Score.
7. 46% of facilities reported emitting one of more chemicals in this list.

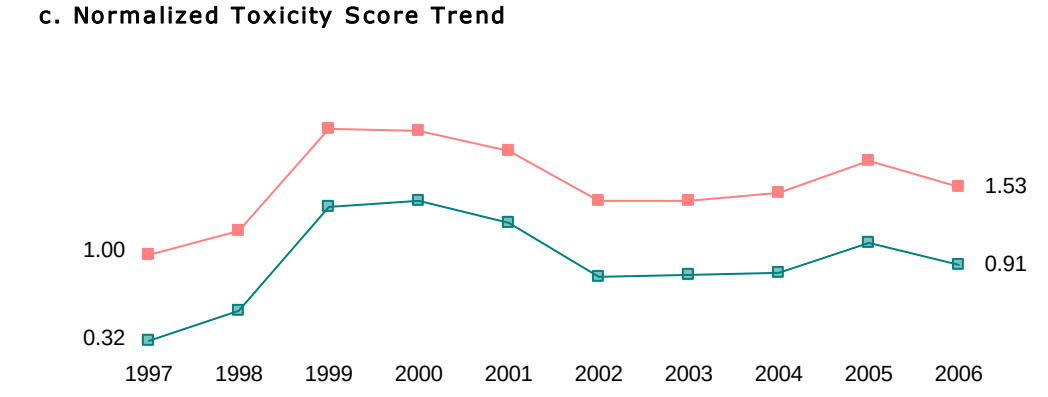
Source: U.S. Environmental Protection Agency

FIGURE 2

Air Emissions Reported to TRI 1997-2006







Note:
Normalized by annual value of shipments.

Sources: U.S. Environmental Protection Agency, U.S. Department of Commerce

Waste Generation and Management

Waste Management Reported to TRI

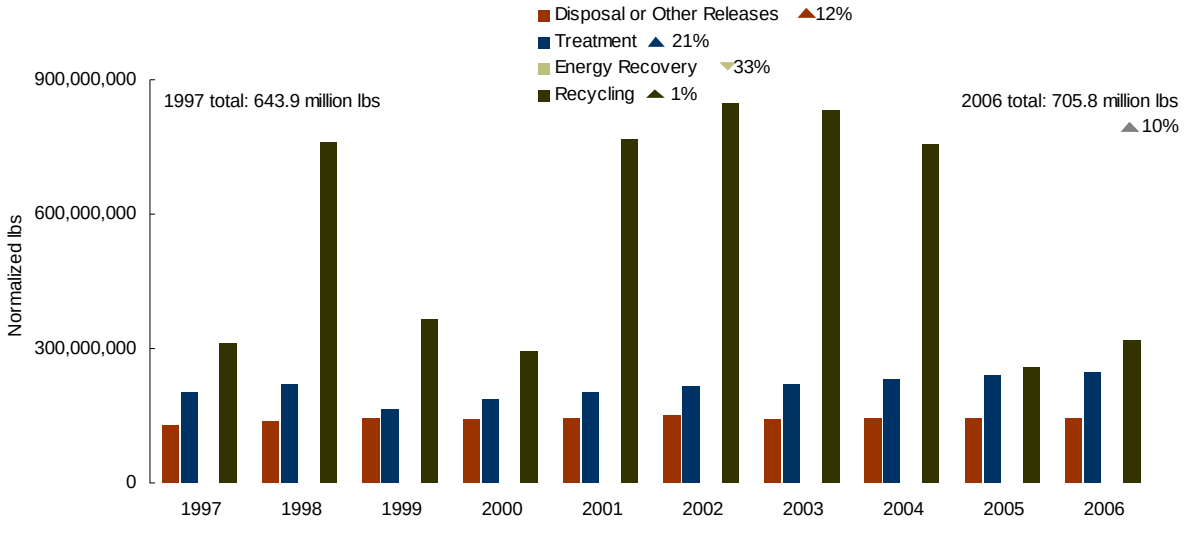
In 2006, the Food & Beverage Manufacturing sector reported managing 740.8 million absolute lbs. of TRI chemicals as waste. When normalized by value of shipments, this quantity represented 10% more than 1997 quantities.

Figure 3 shows how the sector managed this TRI waste. In 2006, 45% was recycled, 35% was treated, 20% was disposed or released to air or water, and less than 1% was recovered for energy use. The pounds managed under each management activity, with the exception of energy recovery, increased over the time period presented. The annual quantities reported as recycled fluctuated dramatically between 280 million lbs. and 850 million lbs. due to reports from a single facility.

The quantity of waste that Food & Beverage Manufacturing facilities disposed to land, as reported to TRI, increased from 9.8 million lbs. in 1997 to 25.9 million lbs. in 2006. When normalized by the value of annual shipments, this represented a 151% increase. As shown in Table 4, nitrate compounds remained the chemical disposed in the greatest quantity in 2006, accounting for over half of overall disposals, and was the chemical most frequently reported as disposed by this sector.

FIGURE 3

TRI Waste Management 1997-2006



Notes:

1. Normalized by annual value of shipments.
2. Disposal or other releases include air releases, water discharges, and land disposals.

Sources: U.S. Environmental Protection Agency, U.S. Department of Commerce

TABLE 4

Top TRI Disposals 2006

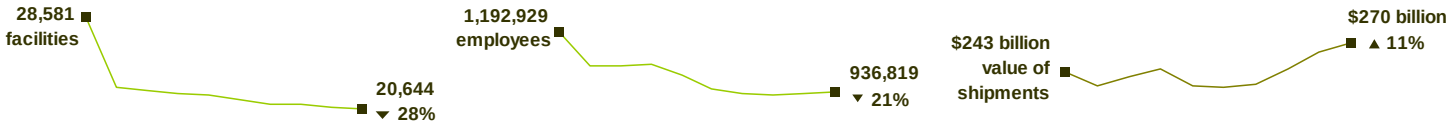
Chemical	Absolute Pounds Reported[1]	Number of Facilities Reporting[2]
Ammonia	4,653,000[3]	124
Barium	1,603,000	17
Lead	95,000	39
Manganese	1,064,000	17
Nitrate Compounds	14,700,000	153
Nitric Acid	781,000	29
Zinc	850,000	31
Percentage of Sector Total	**92%**[4]	**27%**[5]

Notes:
1. Total reported sector disposals: 25.9 million lbs.
2. 1,120 total TRI reporters in the sector.
3. Red indicates that the chemical was one of the top five chemicals reported in the given category.
4. Chemicals in this list represent 92% of the sector's disposals.
5. 27% of facilities reported emitting one of more chemicals in this list.

Source: U.S. Environmental Protection Agency

FOREST PRODUCTS

AT A GLANCE 1997-2006[1]



LATEST ENVIRONMENTAL STATISTICS[2]

Releases of Chemicals Reported to 2006 TRI: 233.8 million lbs

- Air Emissions: 185.4 million lbs
- Water Discharges: 19.1 million lbs
- Waste Disposals: 29.2 million lbs

Recycling, Energy Recovery, or Treatment: 1.4 billion lbs

The data discussed in this Supplement are drawn from U.S. EPA's 2006 Toxics Release Inventory (TRI). See the Data Guide *and the* Data Sources, Methodologies, and Considerations *chapter in the* 2008 Sector Performance Report *for important information and qualifications about how data are generated, synthesized, and presented. The* 2008 Sector Performance Report *is available at: http://www.epa.gov/sectors/performance.html.*

Air Emissions

Air Emissions Reported to TRI

In 2006, 982 facilities in the sector reported 185.4 million absolute lbs. of air emissions to EPA's TRI. Between 1997 and 2006, absolute TRI-reported air emissions declined by 25%, as show in Figure 2a. When normalized by the sector's value of shipments (VOS) over the period, air emissions decreased 17%, as seen in Figure 2b.

Summing the Toxicity Scores for all of the air emissions reported to TRI by the sector produces the trend illustrated in Figure 2c. The sector's Toxicity Score, when normalized by VOS, decreased 29% over this period.

In 2006, 86% of the forest product sector's TRI air emissions were also HAPs and 58% of the sector's Toxicity Score was attributed to HAPs. Trends in HAP emissions showed similar declines to the trends in air emissions for all TRI chemicals when comparing either pounds reported or the Toxicity Scores. Important methodological considerations regarding Toxicity Scores are discussed in the *2008 Sector Performance Report's* Data Guide, which explains the underlying assumptions and limitations of Toxicity Scores.

Table 1 presents the top TRI-reported chemicals emitted to air by the sector based on three indicators.

TABLE 1

Top TRI Air Emissions 2006

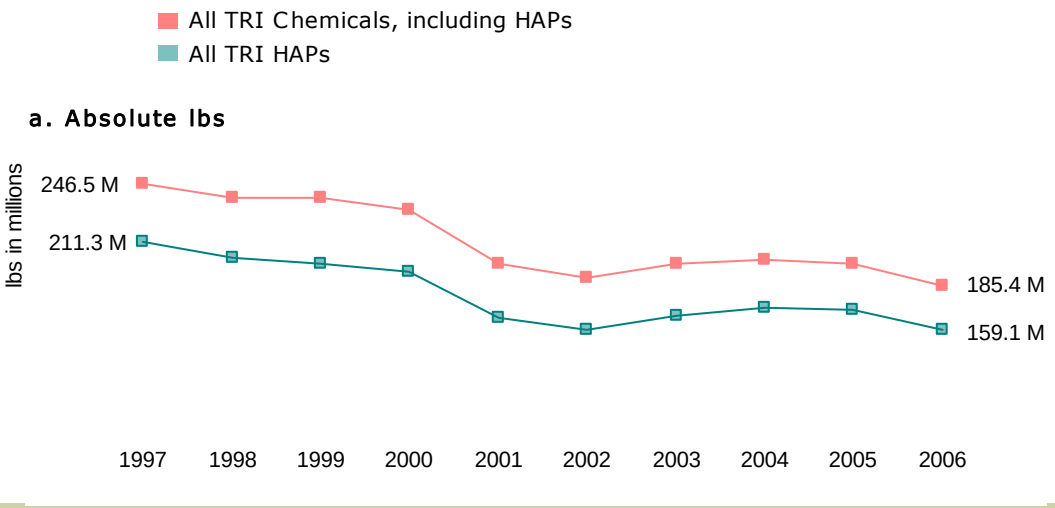
Chemical	Absolute Pounds Reported[1]	Percentage of Toxicity Score	Number of Facilities Reporting[2]
Acetaldehyde[3]	8,243,000[4]	4%	146
Acrolein	52,000	10%	6
Ammonia	16,850,000	1%	165
Chlorine Dioxide	388,000	8%	76
Dioxin And Dioxin-Like Compounds	2	<1%	265
Formaldehyde	5,891,000	8%	207
Hydrochloric Acid	15,717,000	3%	130
Lead	41,000	1%	506
Manganese	314,000	25%	147
Methanol	116,232,000	<1%	345
Polycyclic Aromatic Compounds	81,000	3%	188
Sulfuric Acid	7,170,000	29%	94
Percentage of Sector Total	**92%**[5]	**91%**[6]	**71%**[7]

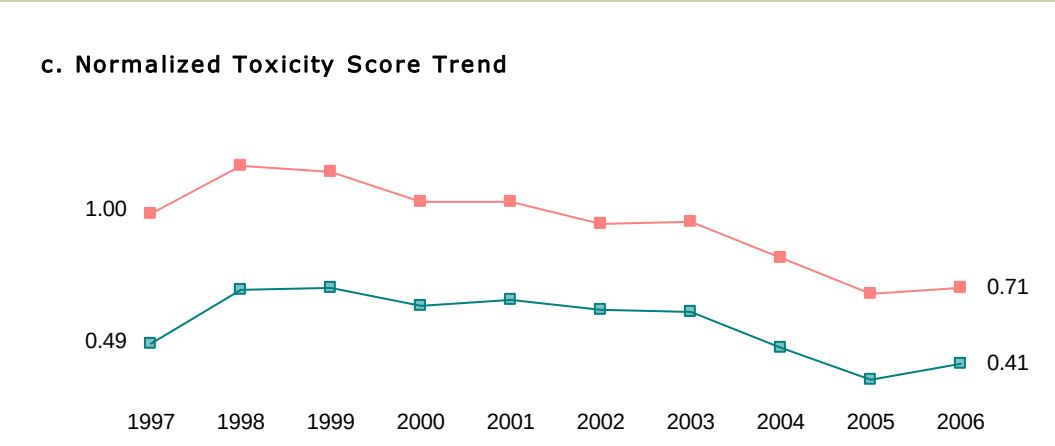
Notes:
1. Total reported sector air releases: 185.4 million lbs.
2. 982 total TRI reporters in the sector.
3. *Italics* indicate a hazardous air pollutant under section 112 of Clean Air Act.
4. Red indicates that the chemical was one of the top five chemicals reported in the given category.
5. Chemicals in this list represent 92% of the sector's air emissions.
6. Chemicals in this list represent 91% of the sector's Toxicity Score.
7. 71% of facilities reported emitting one of more chemicals in this list.

Source: U.S. Environmental Protection Agency

FIGURE 2

Air Emissions Reported to TRI 1997-2006





Note:
Normalized by annual value of shipments.

Sources: U.S. Environmental Protection Agency, U.S. Department of Commerce

Waste Generation and Management

Waste Management Reported to TRI

In 2006, the Forest Products sector reported managing 1.7 billion absolute lbs. of TRI chemicals as waste. As shown in Figure 3, when normalized by VOS, the quantity of waste managed by the sector remained relatively steady between 1997 and 2006. In 2006, 14% of the TRI-reported waste was disposed or released, 70% was treated, 12% was recovered for energy, and 4% was recycled.

In 2006, the sector reported disposing 29.2 million lbs. of TRI chemicals to land or transferring the chemicals to offsite locations for disposal. As shown in Table 4, manganese accounted for almost half of the total pounds disposed by the sector as waste, with lead being the chemical most frequently reported as disposed.

TABLE 4

Top TRI Disposals 2006

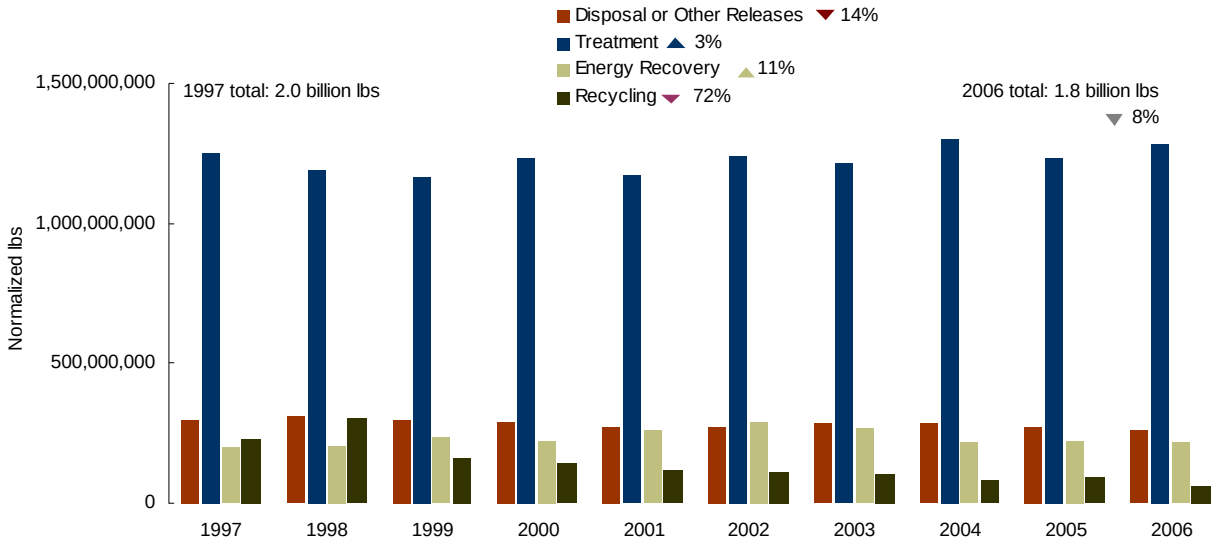
Chemical	Absolute Pounds Reported[1]	Number of Facilities Reporting[2]
Barium	3,591,000[3]	99
Dioxin And Dioxin-Like Compounds	2	197
Lead	519,000	395
Manganese	13,647,000	137
Mercury	12,000	108
Methanol	996,000	111
Vanadium	1,204,000	41
Zinc	7,748,000	105
Percentage of Sector Total	**95%[4]**	**46%[5]**

Notes:
1. Total reported sector disposals: 29.2 million lbs.
2. 982 total TRI reporters in the sector.
3. Red indicates that the chemical was one of the top five chemicals reported in the given category.
4. Chemicals in this list represent 95% of the sector's disposals.
5. 46% of facilities reported emitting one of more chemicals in this list.

Source: U.S. Environmental Protection Agency

FIGURE 3

TRI Waste Management 1997-2006



Notes:
1. Normalized by annual value of shipments.
2. Disposal or other releases include air releases, water discharges, and land disposals.

Sources: U.S. Environmental Protection Agency, U.S. Department of Commerce

IRON & STEEL

AT A GLANCE 1997-2006[1]

LATEST ENVIRONMENTAL STATISTICS[2]

Releases of Chemicals Reported to 2006 TRI: 293.1 million lbs

Air Emissions: 4.1 million lbs

Water Discharges: 2.3 million lbs

Waste Disposals: 286.7 million lbs

Recycling, Energy Recovery, or Treatment: 459.1 million lbs

The data discussed in this Supplement are drawn from U.S. EPA's 2006 Toxics Release Inventory (TRI). See the Data Guide *and the* Data Sources, Methodologies, and Considerations *chapter in the* 2008 Sector Performance Report *for important information and qualifications about how data are generated, synthesized, and presented. The* 2008 Sector Performance Report *is available at: http://www.epa.gov/sectors/performance.html.*

Air Emissions

Air Emissions Reported to TRI

In 2006, 84 facilities in the sector reported 4.1 million absolute lbs. of air emissions to EPA's TRI. Between 1997 and 2006, TRI-reported absolute and normalized air emissions declined by 58%, as show in Figure 2a and 2b, with production levels for the sector remaining relatively steady.

Summing the Toxicity Scores for all of the air emissions reported to TRI by the sector produces the trend illustrated in Figure 2c. The sector's total Toxicity Score fluctuated from over the years but remained relatively steady over the decade. The increase in Toxicity Score in 2006 can be attributed to a single facility that reported an average of 4,400 pounds of manganese releases to air between 1997 and 2001, followed by no reported releases until 2006, when it reported manganese air emissions of 116,000 pounds. Important methodological considerations regarding Toxicity Scores are discussed in the *2008 Sector Performance Report's* Data Guide, which explains the underlying assumptions and limitations of Toxicity Scores.

HAPs accounted for 34% of the sector's absolute air emissions reported to TRI in 2006, and almost all the sector's Toxicity Score. The sector's trend for HAP emissions is similar to the trend for all TRI air emissions, as shown in Figure 2a.

Table 1 presents the top TRI-reported chemicals emitted to air by the sector based on three indicators.

TABLE 1

Top TRI Air Emissions 2006

Chemical	Absolute Pounds Reported[1]	Percentage of Toxicity Score	Number of Facilities Reporting[2]
Ammonia	670,000[3]	<1%	12
Benzene[4]	138,000	<1%	6
Cadmium	1,000	1%	15
Chromium	23,000	<1%[5]	74
Hydrochloric Acid	297,000	<1%	17
Lead	108,000	5%	82
Manganese	482,000	90%	82
Mercury	6,000	<1%	67
Nickel	23,000	2%	67
Sulfuric Acid	55,000	1%	4
Zinc	1,857,000	<1%	78
Percentage of Sector Total	**88%**[6]	**99%**[7]	**100%**[8]

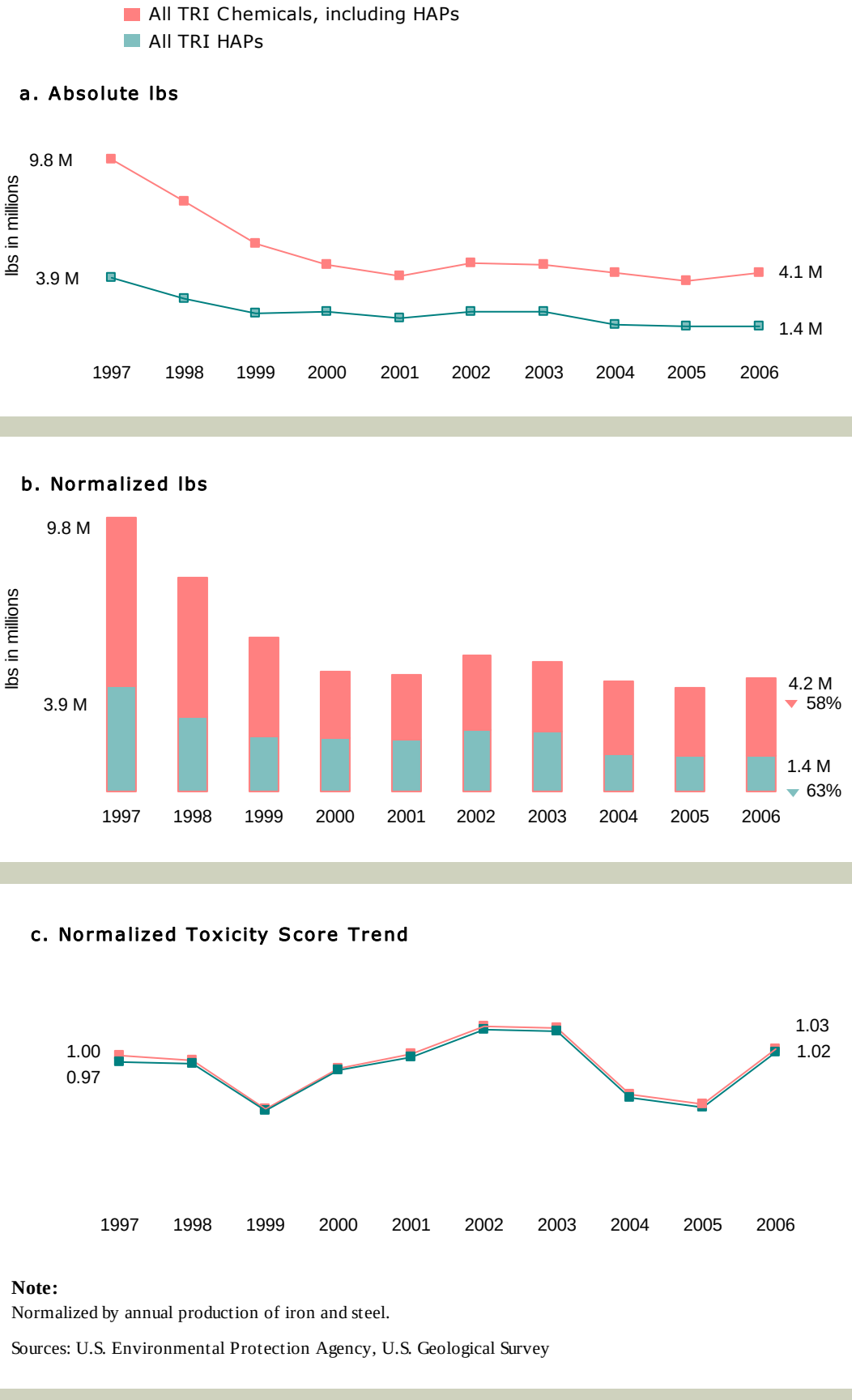
Notes:

1. Total reported sector air releases: 4.1 million lbs.
2. 84 total TRI reporters in the sector.
3. Red indicates that the chemical was one of the top five chemicals reported in the given category.
4. *Italics* indicate a hazardous air pollutant under section 112 of Clean Air Act.
5. Based on chromium speciation data for this sector from EPA's National Emissions Inventory, chromium Toxicity Scores were adjusted to assume that 3% was hexavalent and 97% was trivalent.
6. Chemicals in this list represent 88% of the sector's air emissions.
7. Chemicals in this list represent 99% of the sector's Toxicity Score.
8. 100% of facilities reported emitting one of more chemicals in this list.

Source: U.S. Environmental Protection Agency

FIGURE 2

Air Emissions Reported to TRI 1997-2006



Note:
Normalized by annual production of iron and steel.

Sources: U.S. Environmental Protection Agency, U.S. Geological Survey

Waste Generation and Management

Waste Management Reported to TRI

In 2006, the Iron & Steel sector reported managing 752.2 million absolute lbs. of TRI chemicals as waste. When normalized by production, this represented a 45% increase since 1997. Figure 3 shows how the sector managed these chemicals. In 2006, 39% of the TRI-reported waste was disposed or released, 49% was recycled, 9% was recovered for energy, and 3% was treated.

In 2006, the sector reported disposing 286.7 million lbs. of TRI chemicals to land or transferring the chemicals to offsite locations for disposal. As shown in Table 3, zinc accounted for three-quarters of the total pounds disposed by the sector. Lead and manganese were the chemicals most frequently reported as disposed.

TABLE 3

Top TRI Disposals 2006

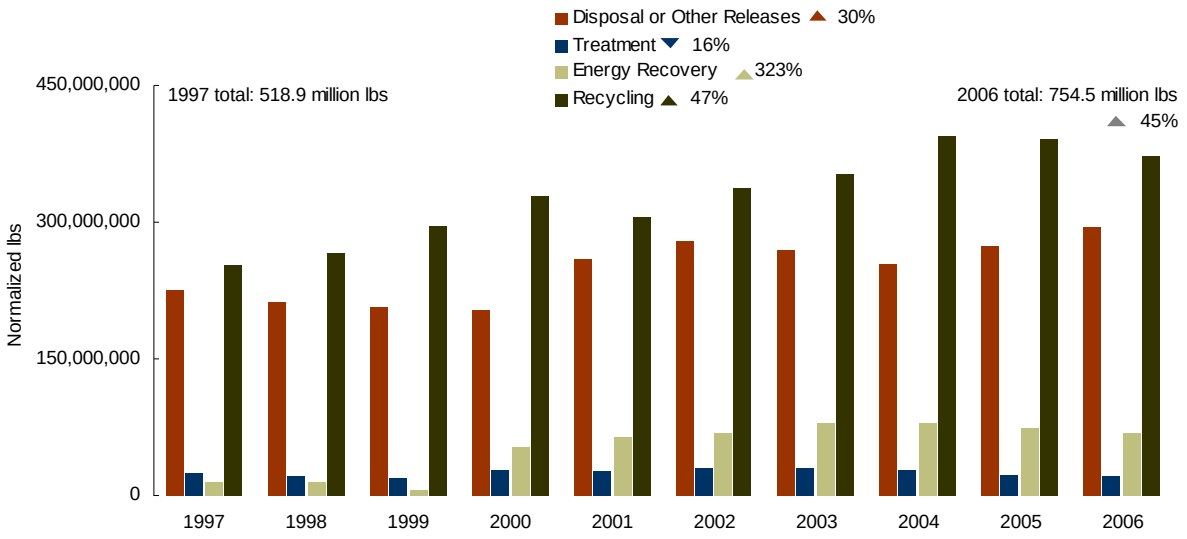
Chemical	Absolute Pounds Reported[1]	Number of Facilities Reporting[2]
Chromium	4,873,000[3]	65
Copper	2,533,000	55
Lead	10,918,000	69
Manganese	48,781,000	69
Nickel	814,000	57
Zinc	214,247,000	67
Percentage of Sector Total	**98%[4]**	**86%[5]**

Notes:
1. Total reported sector disposals: 286.7 million lbs.
2. 84 total TRI reporters in the sector.
3. Red indicates that the chemical was one of the top five chemicals reported in the given category.
4. Chemicals in this list represent 98% of the sector's disposals.
5. 86% of facilities reported emitting one of more chemicals in this list.

Source: U.S. Environmental Protection Agency

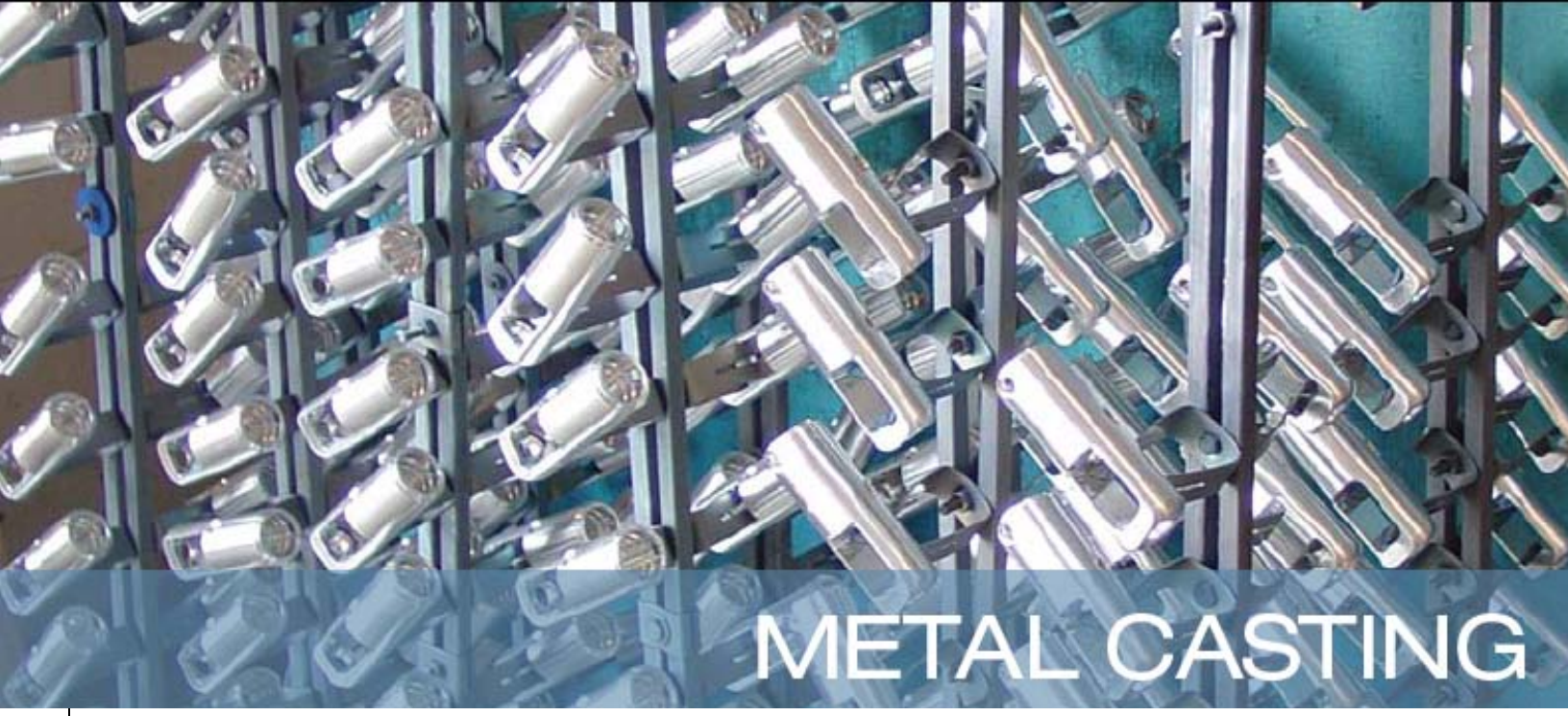
FIGURE 3

TRI Waste Management 1997-2006



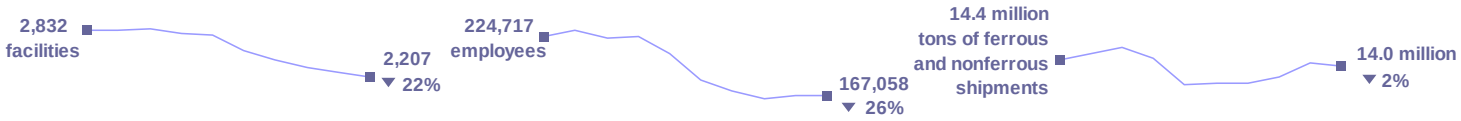
Notes:
1. Normalized by annual production of iron and steel.
2. Disposal or other releases include air releases, water discharges, and land disposals.

Sources: U.S. Environmental Protection Agency, U.S. Geological Survey



METAL CASTING

AT A GLANCE 1997-2006[1]



LATEST ENVIRONMENTAL STATISTICS[2]

Releases of Chemicals Reported to 2006 TRI: 40.1 million lbs

- Air Emissions: 3.2 million lbs
- Water Discharges: 68,000 lbs
- Waste Disposals: 36.8 million lbs

Recycling, Energy Recovery, or Treatment: 126.3 million lbs

The data discussed in this Supplement are drawn from U.S. EPA's 2006 Toxics Release Inventory (TRI). See the Data Guide *and the* Data Sources, Methodologies, and Considerations *chapter in the* 2008 Sector Performance Report *for important information and qualifications about how data are generated, synthesized, and presented. The* 2008 Sector Performance Report *is available at: http://www.epa.gov/sectors/performance.html.*

Air Emissions

Air Emissions Reported to TRI

In 2006, 620 facilities in the sector reported 3.2 million absolute lbs. of air emissions to TRI. Between 1997 and 2006, TRI-reported air emissions, in absolute pounds, declined by 64%, as show in Figure 2a. Because production levels for the sector remained relatively steady over the 10 years, the emissions trend, when normalized by ferrous and nonferrous shipments, was very similar to the trend for absolute emissions, as shown in Figure 2b.

Summing the Toxicity Scores for all of the air emissions reported to TRI by the sector produces the trend illustrated in Figure 2c. The sector's Toxicity Score declined 62% from 1997 to 2006. Important methodological considerations regarding Toxicity Scores are discussed in the *2008 Sector Performance Report's* Data Guide, which explains the underlying assumptions and limitations of Toxicity Scores.

HAPs accounted for 66% of the sector's air emissions reported to TRI in 2006, and 78% of the sector's Toxicity Score. Over the 10-year period, absolute and normalized pounds of HAPs emitted declined by 64%.

Table 1 presents the top TRI-reported chemicals emitted to air by the sector based on three indicators.

TABLE 1

Top TRI Air Emissions 2006

Chemical	Absolute Pounds Reported[1]	Percentage of Toxicity Score	Number of Facilities Reporting[2]
Aluminum	323,000[3]	1%	47
Benzene[4]	282,000	<1%	11
Chromium	54,000	1%[5]	146
Cobalt	6,000	2%	28
Copper	146,000	1%	288
Diisocyanates	11,000	19%[6]	36
Lead	88,000	7%	351
Manganese	162,000	56%	193
Nickel	50,000	10%	195
Phenol	328,000	<1%	50
Xylene	244,000	<1%	10
Zinc	216,000	<1%	83
Percentage of Sector Total	**60%**[7]	**98%**[8]	**85%**[9]

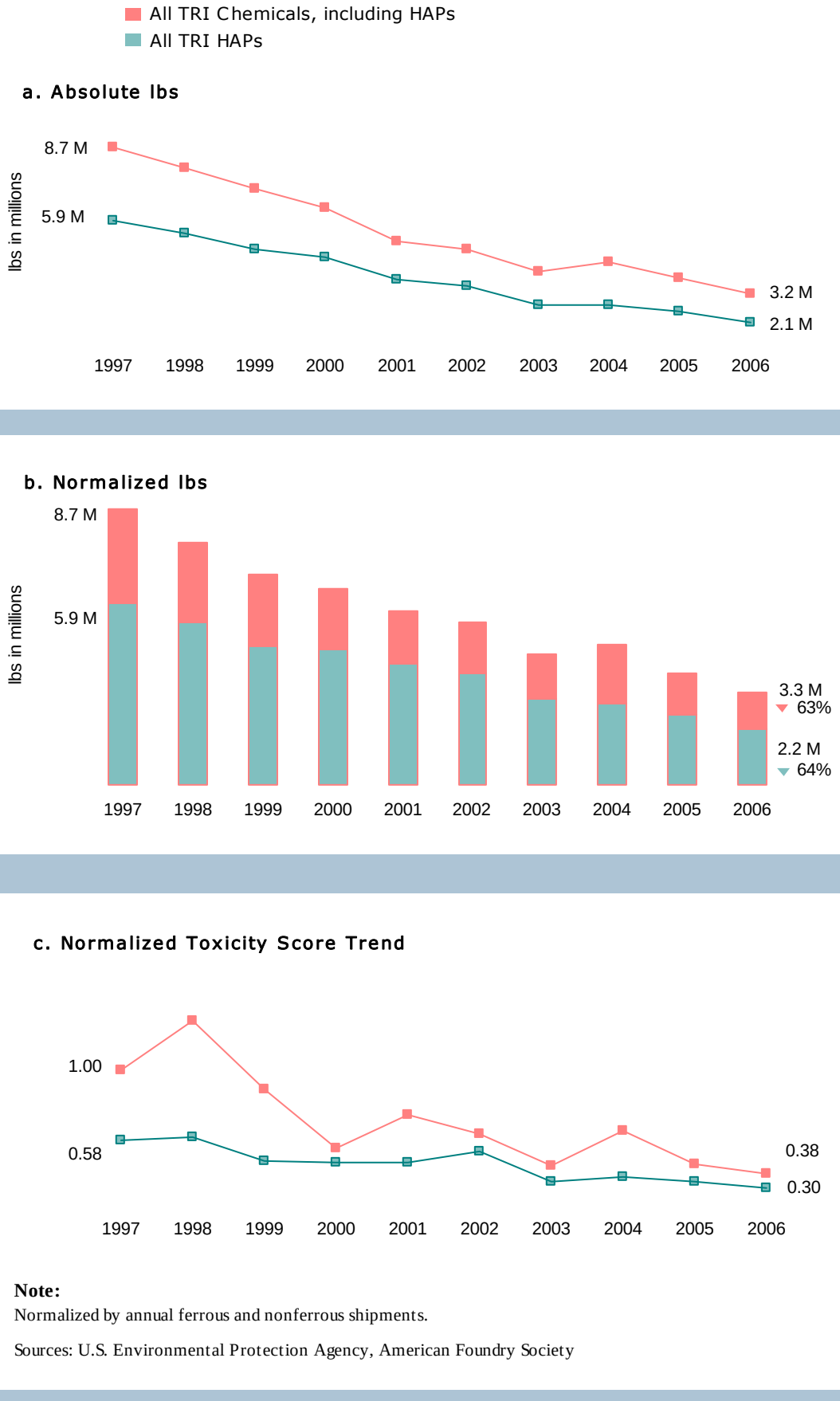
Notes:

1. Total reported sector air releases: 3.2 million lbs.
2. 620 total TRI reporters in the sector.
3. Red indicates that the chemical was one of the top five chemicals reported in the given category.
4. *Italics* indicate a hazardous air pollutant under section 112 of Clean Air Act.
5. Based on chromium speciation data for this sector from EPA's National Emissions Inventory, chromium Toxicity Scores were adjusted to assume that 3% was hexavalent and 97% was trivalent.
6. Calculation of Toxicity Score for diisocyanates conservatively assumed that all diisocyanates emissions were hexamethylene-1,6-diisocyanates. Other diisocyanates chemicals with lower toxicity scores may constitute the majority of reported diisocyanates emissions from the sector. Thus, RSEI analyses may overestimate the relative harmfulness of diisocyanates emissions.
7. Chemicals in this list represent 60% of the sector's air emissions.
8. Chemicals in this list represent 98% of the sector's Toxicity Score.
9. 85% of facilities reported emitting one of more chemicals in this list.

Source: U.S. Environmental Protection Agency

FIGURE 2

Air Emissions Reported to TRI 1997-2006



Note:
Normalized by annual ferrous and nonferrous shipments.

Sources: U.S. Environmental Protection Agency, American Foundry Society

Waste Generation and Management

Waste Management Reported to TRI

In 2006, the sector reported managing 166.4 million absolute lbs. of TRI chemicals as waste. When normalized by product shipped, this represented a 36% decrease since 1997, as shown in Figure 3. In 2006, 24% of the TRI-reported waste was disposed or released, 69% was recycled, 7% was treated, and less than 1% was recovered for energy.

In 2006, the sector reported disposing 36.8 million lbs. of TRI chemicals to land or transferring the chemicals to offsite locations for disposal. As shown in Table 3, manganese and zinc accounted for almost three-quarters of the total pounds disposed by the sector. Lead was the chemical most frequently reported as disposed.

TABLE 3

Top TRI Disposals 2006

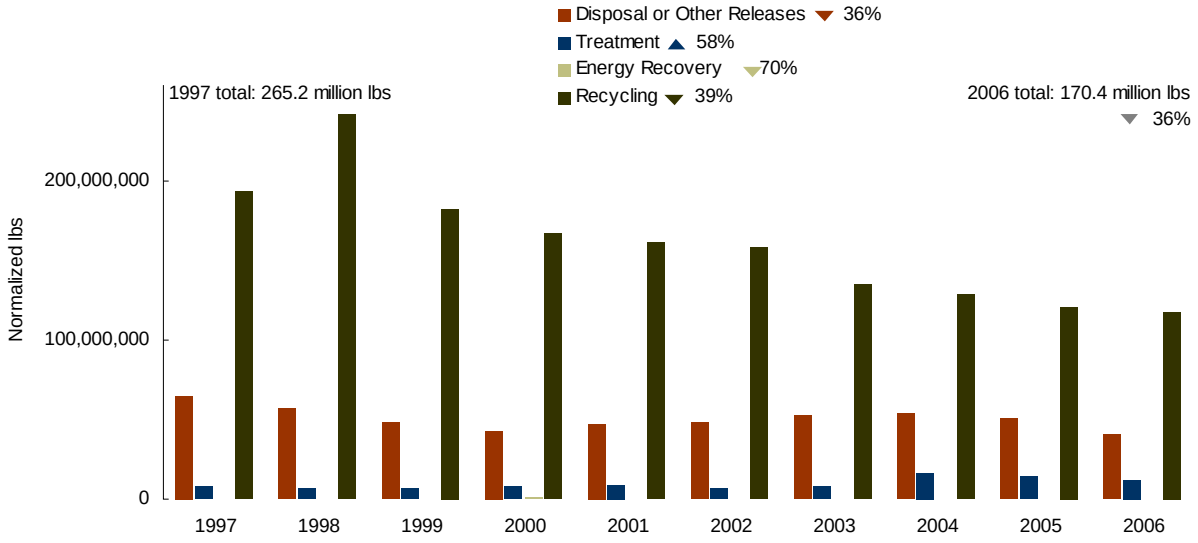
Chemical	Absolute Pounds Reported[1]	Number of Facilities Reporting[2]
Aluminum Oxide	1,610,000[3]	5
Chromium	1,788,000	130
Copper	1,483,000	191
Lead	1,872,000	257
Manganese	14,596,000	177
Nickel	647,000	150
Zinc	12,565,000	61
Percentage of Sector Total	**94%[4]**	**59%[5]**

Notes:
1. Total reported sector disposals: 36.8 million lbs.
2. 620 total TRI reporters in the sector.
3. Red indicates that the chemical was one of the top five chemicals reported in the given category.
4. Chemicals in this list represent 94% of the sector's disposals.
5. 59% of facilities reported emitting one of more chemicals in this list.

Source: U.S. Environmental Protection Agency

FIGURE 3

TRI Waste Management 1997-2006

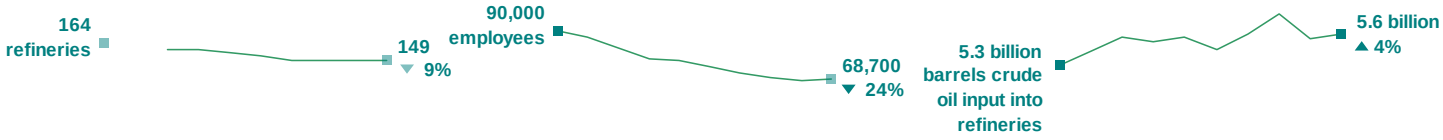


Notes:
1. Normalized by annual ferrous and nonferrous shipments.
2. Disposal or other releases include air releases, water discharges, and land disposals.

Sources: U.S. Environmental Protection Agency, American Foundry Society

Petroleum Refining

AT A GLANCE 1997-2006[1]



LATEST ENVIRONMENTAL STATISTICS[2]

Releases of Chemicals Reported to 2006 TRI: 72.3 million lbs

Air Emissions: 42.8 million lbs

Water Discharges: 22 million lbs

Waste Disposals: 7.5 million lbs

Recycling, Energy Recovery, or Treatment: 1.2 billion lbs

The data discussed in this Supplement are drawn from U.S. EPA's 2006 Toxics Release Inventory (TRI). See the Data Guide *and the* Data Sources, Methodologies, and Considerations *chapter in the* 2008 Sector Performance Report *for important information and qualifications about how data are generated, synthesized, and presented. The* 2008 Sector Performance Report *is available at: http://www.epa.gov/sectors/performance.html.*

Air Emissions

Air Emissions Reported to TRI

In 2006, 165 facilities[3] in the sector reported 42.8 million absolute lbs. of air emissions to EPA's TRI. Between 1997 and 2006, TRI-reported air emissions declined by 29%, as show in Figure 2a. When normalized by crude oil inputs into refineries, air emissions decreased by 32% over the 10 years, as shown in Figure 2b.

Summing the Toxicity Scores for all of the air emissions reported to TRI by the sector produces the trend illustrated in Figure 2c. While the normalized Toxicity Score increased by 72% over the 10-year period shown in Figure 2c, the Toxicity Score has decreased each year since 2002. Important methodological considerations regarding Toxicity Scores are discussed in the *2008 Sector Performance Report's* Data Guide, which explains the underlying assumptions and limitations of Toxicity Scores.

In absolute pounds, HAPs accounted for 44% of the TRI chemicals emitted to air and 24% of the Toxicity Score in 2006. Between 1997 and 2006, the trend for HAP emissions follows a similar declining trend as for emissions of all TRI chemicals.

Table 1 presents the top TRI-reported chemicals emitted to air by the sector based on three indicators.

TABLE 6

Top TRI Air Emissions 2006

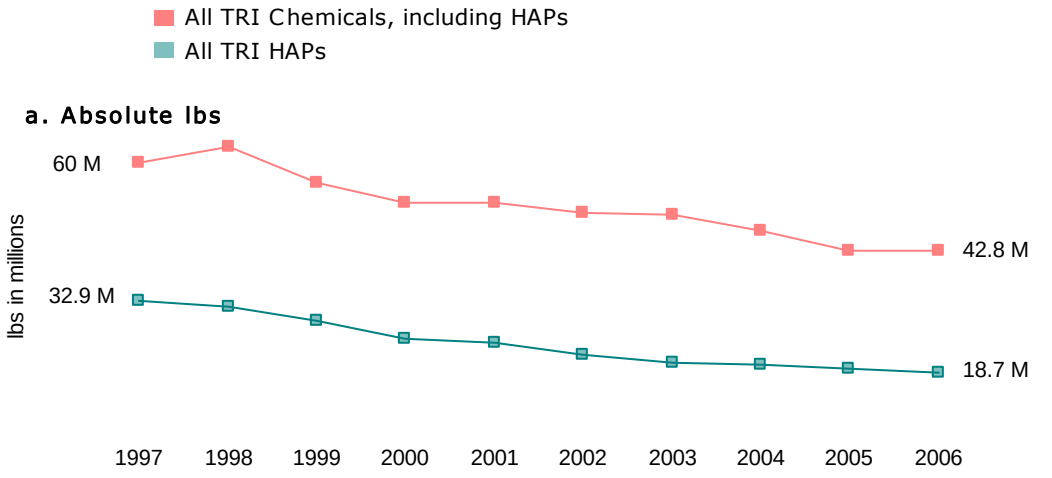
Chemical	Absolute Pounds Reported[1]	Percentage of Toxicity Score	Number of Facilities Reporting[2]
1,2,4-Trimethylbenzene	686,000	1%[3]	129
Ammonia	8,600,000	1%	107
Benzene[4]	1,865,000	1%	147
Chlorine	130,000	6%	33
Ethylbenzene	656,000	<1%	141
N-Hexane	3,661,000	<1%	144
Nickel	82,000	8%	68
Polycyclic Aromatic Compounds	34,000	3%	132
Propylene	4,060,000	<1%	113
Sulfuric Acid	7,882,000	73%	75
Toluene	3,721,000	<1%	147
Xylene	2,973,000	<1%	145
Percentage of Sector Total	**80%**[5]	**92%**[6]	**98%**[7]

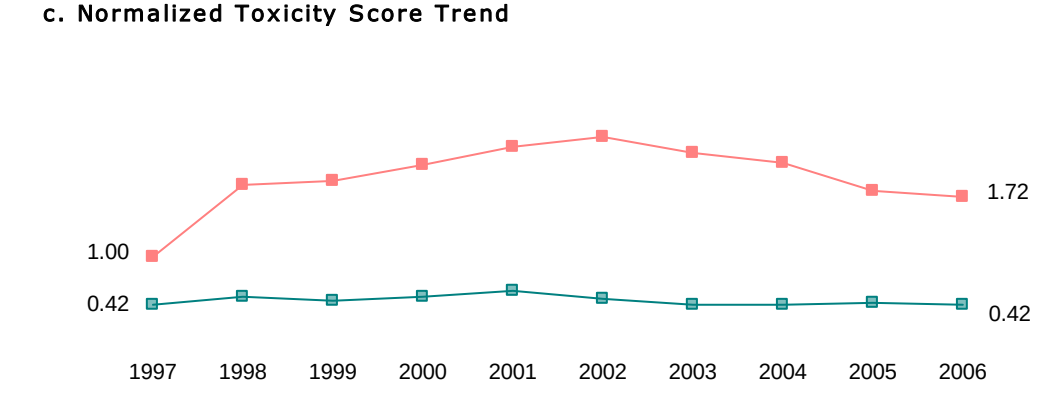
Notes:
1. Total reported sector air releases: 42.8 million lbs.
2. 165 total TRI reporters in the sector.
3. Red indicates that the chemical was one of the top five chemicals reported in the given category.
4. *Italics* indicate a hazardous air pollutant under section 112 of Clean Air Act.
5. Chemicals in this list represent 80% of the sector's air emissions.
6. Chemicals in this list represent 92% of the sector's Toxicity Score.
7. 98% of facilities reported emitting one of more chemicals in this list.

Source: U.S. Environmental Protection Agency

FIGURE 2

Air Emissions Reported to TRI 1997-2006





Note:
Normalized by annual crude oil inputs into refineries.

Sources: U.S. Environmental Protection Agency, U.S. Department of Energy

Waste Generation and Management

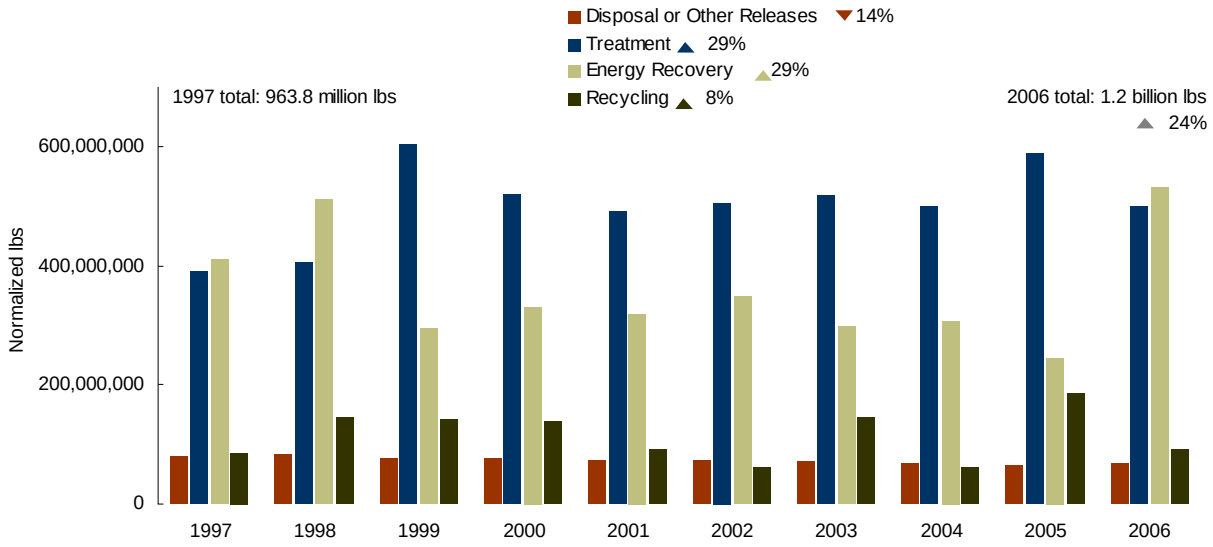
Waste Management Reported to TRI

In 2006, refineries reported managing 1.2 billion absolute lbs. of TRI chemicals as waste. When normalized by crude oil inputs into refineries, this represented a 24% increase since 1997. Figure 3 shows how this waste was managed. In 2006, 42% was treated, 45% was recovered for energy use, and 8% was recycled, while 6% of the TRI-reported waste was disposed or released. The increase in energy recovery in 2006 was largely driven by one facility's increase in the quantity of propylene used for energy recovery. The 2006 decrease in recycling resulted from changes from multiple facilities, influenced by one facility that reported recycling large quantities of sulfuric acid in 2005, but did not report any recycling of this chemical in 2006.

In 2006, refineries reported disposing 7.5 million lbs. of TRI chemicals to land or transferring the chemicals to offsite locations for disposal. As shown in Table 3, asbestos, as reported by one facility, accounted for 18% of the total pounds disposed by the sector. Prior to 2006, the facility's reported asbestos disposals to landfills fluctuated from between no disposals and 724,000 pounds. Lead was the chemical most frequently reported as disposed by the sector.

FIGURE 3

TRI Waste Management 1997-2006



Notes:
1. Normalized by annual crude oil inputs into refineries.
2. Disposal or other releases include air releases, water discharges, and land disposals.

Sources: U.S. Environmental Protection Agency, U.S. Department of Energy

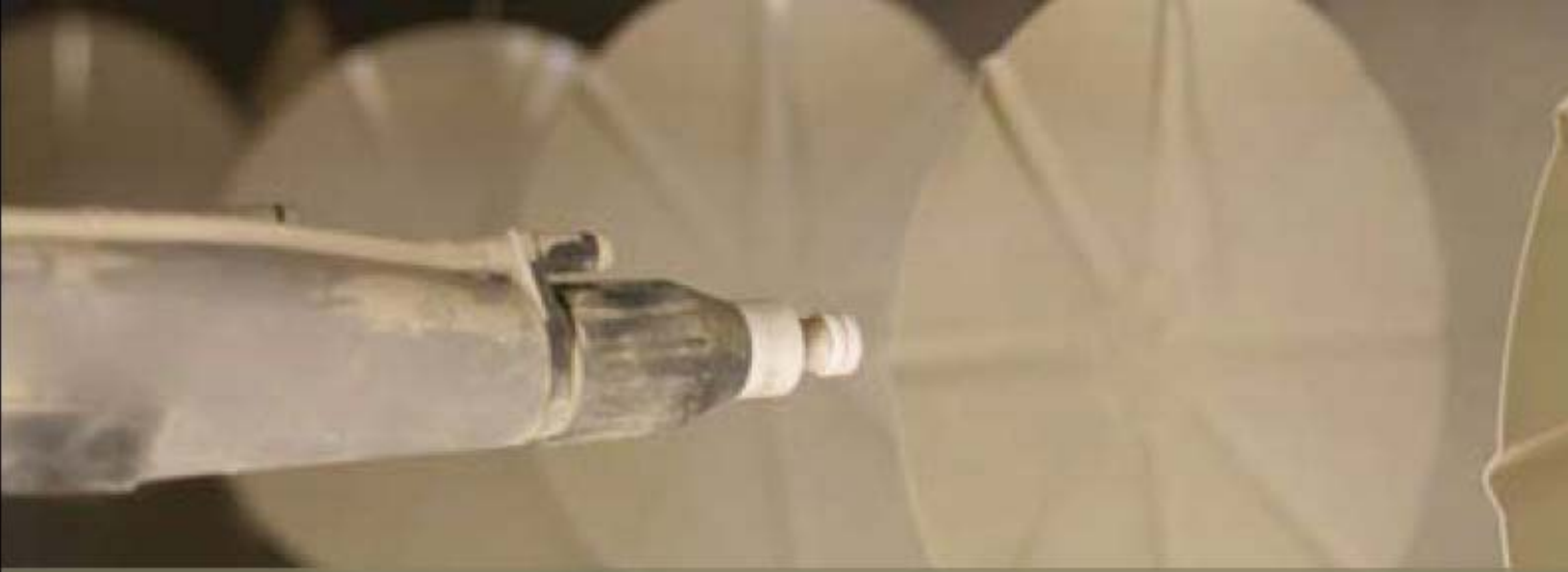
TABLE 8

Top TRI Disposals 2006

Chemical	Absolute Pounds Reported[1]	Number of Facilities Reporting[2]
Ammonia	827,000[3]	29
Asbestos	1,350,000	1
Benzene	99,000	107
Ethylbenzene	136,000	96
Lead	159,000	116
Molybdenum Trioxide	720,000	38
Toluene	137,000	102
Xylene	602,000	106
Zinc	701,000	39
Percentage of Sector Total	**63%**[4]	**82%**[5]

Notes:
1. Total reported sector disposals: 7.5 million lbs.
2. 165 total TRI reporters in the sector.
3. Red indicates that the chemical was one of the top five chemicals reported in the given category.
4. Chemicals in this list represent 63% of the sector's disposals.
5. 82% of facilities reported emitting one of more chemicals in this list.

Source: U.S. Environmental Protection Agency



PAINT & COATINGS

AT A GLANCE 1997-2006[1]

LATEST ENVIRONMENTAL STATISTICS[2]

Releases of Chemicals Reported to 2006 TRI: 5.7 million lbs

Air Emissions: 4 million lbs

Water Discharges: 24,000 lbs

Waste Disposals: 1.6 million lbs

Recycling, Energy Recovery, or Treatment: 122.5 million lbs

The data discussed in this Supplement are drawn from U.S. EPA's 2006 Toxics Release Inventory (TRI). See the Data Guide *and the* Data Sources, Methodologies, and Considerations *chapter in the* 2008 Sector Performance Report *for important information and qualifications about how data are generated, synthesized, and presented. The* 2008 Sector Performance Report *is available at: http://www.epa.gov/sectors/performance.html.*

Air Emissions

Air Emissions Reported to TRI

In 2006, 453 facilities in the sector reported 4 million absolute lbs. of air emissions to EPA's TRI. Between 1997 and 2006, absolute TRI-reported air emissions declined by 56%, as show in Figure 1a. When normalized by the quantity of product shipments over this period, air emissions declined by about the same amount, as seen in Figure 1b. The normalized and absolute data are similar because production remained relatively steady over the period.

Summing the Toxicity Scores for all of the air emissions reported to TRI by the sector produces the trend illustrated in Figure 1c. The sector's total Toxicity Score, normalized by product shipments, declined by 80% from 1997 to 2006. Important methodological considerations regarding Toxicity Scores are discussed in the *2008 Sector Performance Report's* Data Guide, which explains the underlying assumptions and limitations of Toxicity Scores.

In absolute pounds, HAPs accounted for most (88%) of the sector's pounds of air emissions reported to TRI in 2006; therefore, trends in HAP emissions showed similar declines to the trends in air emissions for all TRI chemicals when based on either pounds reported or the Toxicity Score.

Table 1 presents the top TRI-reported chemicals emitted to air by the sector based on three indicators.

TABLE 1

Top TRI Air Emissions 2006

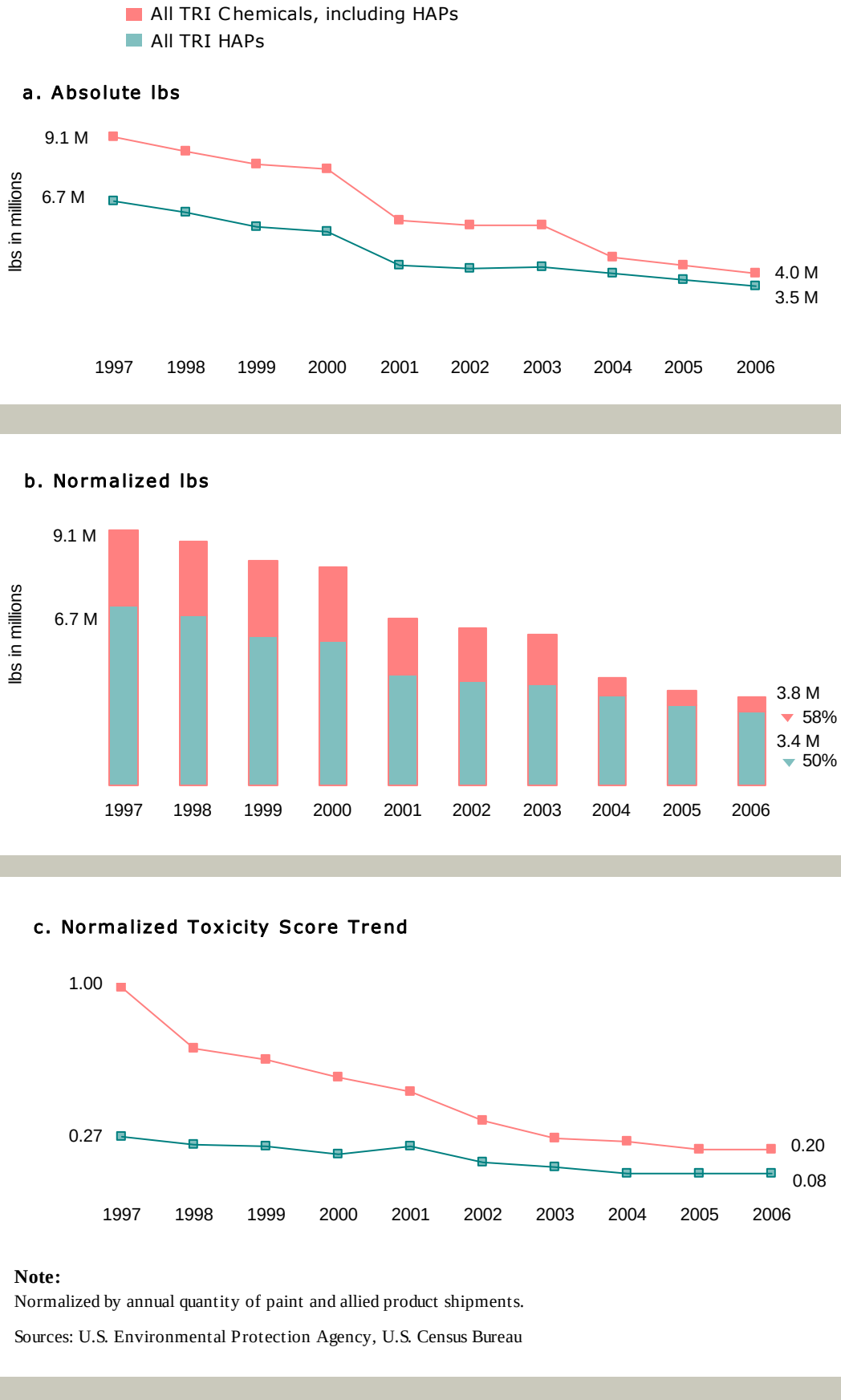
Chemical	Absolute Pounds Reported[1]	Percentage of Toxicity Score	Number of Facilities Reporting[2]
1,2,4-Trimethylbenzene	161,384	12%[3]	116
Certain Glycol Ethers[4]	254,224	6%	166
Chromium	1,558	8%[5]	25
Diisocyanates	766	34%[6]	18
Ethylbenzene	185,435	<1%	130
Ethylene Glycol	308,750	<1%	84
Methanol	388,386	<1%	67
Nickel	1,863	9%	7
Toluene	771,116	<1%	201
Xylene	1,018,695	5%	265
Percentage of Sector Total	**77%**[7]	**75%**[8]	**83%**[9]

Notes:
1. Total reported sector air releases: 4.0 million lbs.
2. 453 total TRI reporters in the sector.
3. Red indicates that the chemical was one of the top five chemicals reported in the given category.
4. *Italics* indicate a hazardous air pollutant under section 112 of Clean Air Act.
5. Based on chromium speciation data for this sector from industry, chromium Toxicity Scores were adjusted to assume that 25% was hexavalent and 75% was trivalent.
6. Calculation of Toxicity Score for diisocyanates conservatively assumed that all diisocyanates emissions were hexamethylene-1,6-diisocyanates. Other diisocyanates chemicals with lower toxicity scores may constitute the majority of reported diisocyanates emissions from the sector. Thus, RSEI analyses may overestimate the relative harmfulness of diisocyanates emissions.
7. Chemicals in this list represent 77% of the sector's air emissions.
8. Chemicals in this list represent 75% of the sector's Toxicity Score.
9. 83% of facilities reported emitting one of more chemicals in this list.

Source: U.S. Environmental Protection Agency

FIGURE 1

Air Emissions Reported to TRI 1997-2006



Note:
Normalized by annual quantity of paint and allied product shipments.

Sources: U.S. Environmental Protection Agency, U.S. Census Bureau

Waste Generation and Management

Waste Management Reported to TRI

In 2006, facilities in the Paint & Coatings sector reported managing 128.1 million absolute lbs. of TRI chemicals as waste. As shown in Figure 2, when normalized by annual product shipments, total waste managed declined 32% between 1997 and 2006. Figure 2 also shows how the sector has managed this waste over time. In 2006, 4% of the TRI-reported waste was disposed or released, 54% was recycled, 31% was recovered for energy, and 11% was treated.

In 2006, the sector reported disposing 1.6 million lbs. of TRI chemicals to land or transferring the chemicals to offsite locations for disposal. As shown in Table 3, zinc accounted for a quarter of the total pounds disposed by the sector and was the chemical most frequently reported as disposed.

TABLE 3

Top TRI Disposals 2006

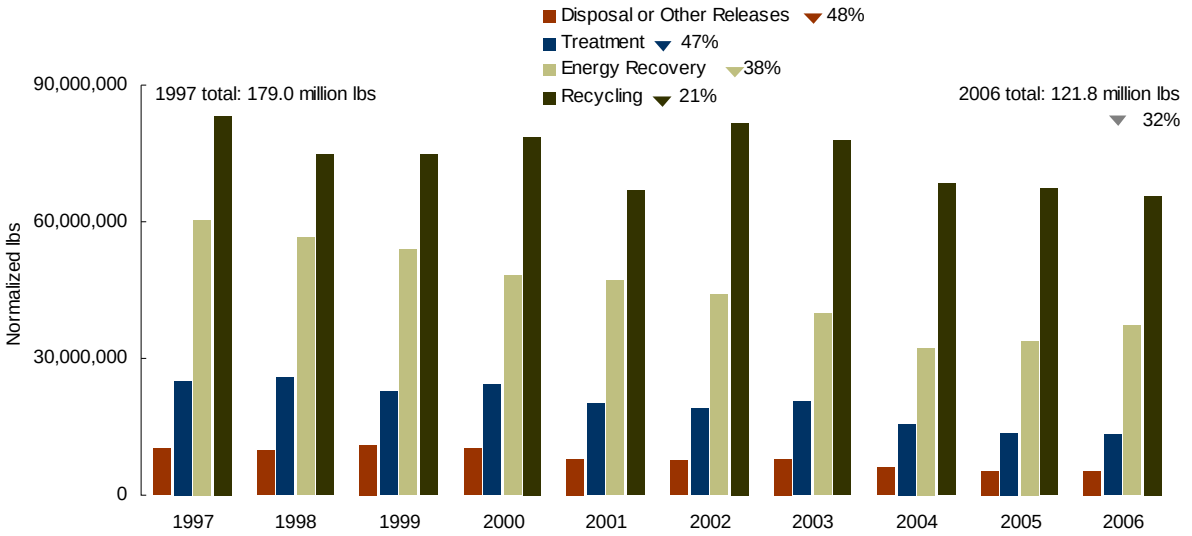
Chemical	Absolute Pounds Reported[1]	Number of Facilities Reporting[2]
3-Iodo-2-Propynyl Butylcarbamate	124,000[3]	10
Barium	132,000	18
Certain Glycol Ethers	45,000	28
Chromium	57,000	29
Di(2-Ethylhexyl) Phthalate	96,000	4
Lead	32,000	77
Xylene	160,000	30
Zinc	397,000	98
Percentage of Sector Total	**65%[4]**	**35%[5]**

Notes:
1. Total reported sector disposals: 1.6 million lbs.
2. 453 total TRI reporters in the sector.
3. Red indicates that the chemical was one of the top five chemicals reported in the given category.
4. Chemicals in this list represent 65% of the sector's disposals.
5. 35% of facilities reported emitting one of more chemicals in this list.

Source: U.S. Environmental Protection Agency

FIGURE 2

TRI Waste Management 1997-2006

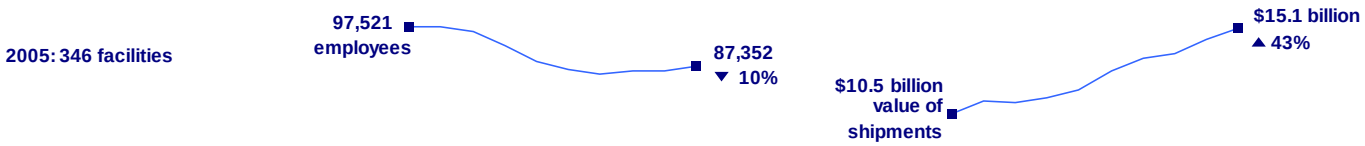


Notes:
1. Normalized by annual quantity of paint and allied product shipments.
2. Disposal or other releases include air releases, water discharges, and land disposals.

Sources: U.S. Environmental Protection Agency, U.S. Census Bureau

SHIPBUILDING & SHIP REPAIR

AT A GLANCE 1997-2006[1]



LATEST ENVIRONMENTAL STATISTICS[2]

Releases of Chemicals Reported to 2006 TRI: 2.5 million lbs

Air Emissions: 2.1 million lbs

Water Discharges: 10,000 lbs

Waste Disposals: 361,000 lbs

Recycling, Energy Recovery, or Treatment: 7.2 million lbs

The data discussed in this Supplement are drawn from U.S. EPA's 2006 Toxics Release Inventory (TRI). See the Data Guide *and the* Data Sources, Methodologies, and Considerations *chapter in the* 2008 Sector Performance Report *for important information and qualifications about how data are generated, synthesized, and presented. The* 2008 Sector Performance Report *is available at: http://www.epa.gov/sectors/performance.html.*

Air Emissions

Air Emissions Reported to TRI

In 2006, 59 facilities in the sector reported 2.1 million absolute lbs. of air emissions to EPA's TRI. Between 1997 and 2006, absolute TRI-reported air emissions declined by 14%, as shown in Figure 1a. When normalized by the sector's value of shipments (VOS), air emissions decreased 27%, as shown in Figure 1b. The 2006 increase in air emissions resulted from 38 facilities in the sector reporting increased air emissions that in aggregate were 596,000 absolute lbs. greater than their emissions in 2005, while 24 facilities reported lower air emissions totaling 241,000 less than their reported air emissions in 2005.

Summing the Toxicity Scores for all of the air emissions reported to TRI by the sector produces the trend illustrated in Figure 1c. When normalized by the sector's VOS, the sector's Toxicity Score fluctuated between 1997 and 2006, declining overall by 41%. Important methodological considerations regarding Toxicity Scores are discussed in the *2008 Sector Performance Report's* Data Guide, which explains the underlying assumptions and limitations of Toxicity Scores.

In absolute pounds, HAPs accounted for 56% of the sector's pounds of air emissions reported to TRI in 2006, and 76% of the Toxicity Score.

Table 1 presents the top TRI-reported chemicals emitted to air by the sector based on three indicators.

TABLE 1

Top TRI Air Emissions 2006

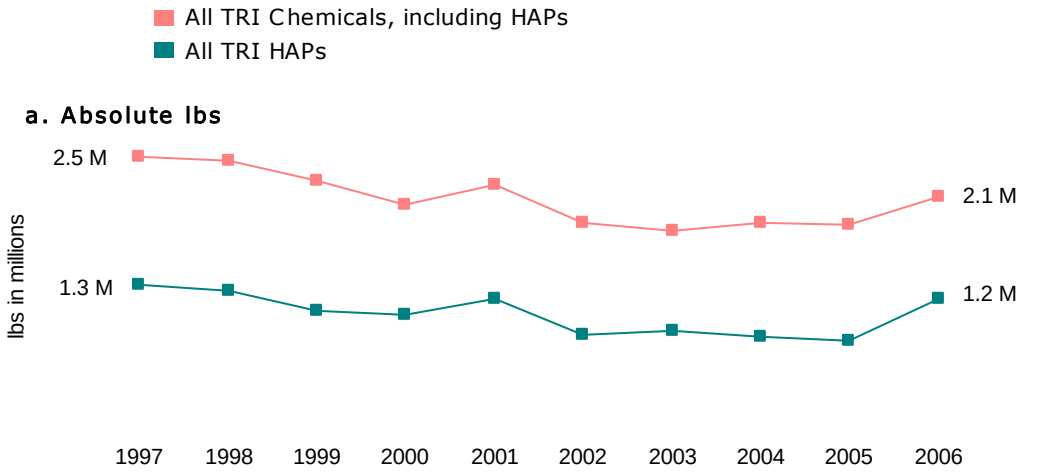
Chemical	Absolute Pounds Reported[1]	Percentage of Toxicity Score	Number of Facilities Reporting[2]
1,2,4-Trimethylbenzene	166,000[3]	9%	8
Chromium[4]	2,000	6%[5]	20
Ethylbenzene	146,000	<1%	8
Manganese	9,000	56%	24
N-Butyl Alcohol	543,000	<1%	19
Nickel	2,000	6%	19
Propylene	104,000	<1%	11
Sulfuric Acid	28,000	9%	1
Xylene	765,000	3%	32
Percentage of Sector Total	**83%**[6]	**91%**[7]	**88%**[8]

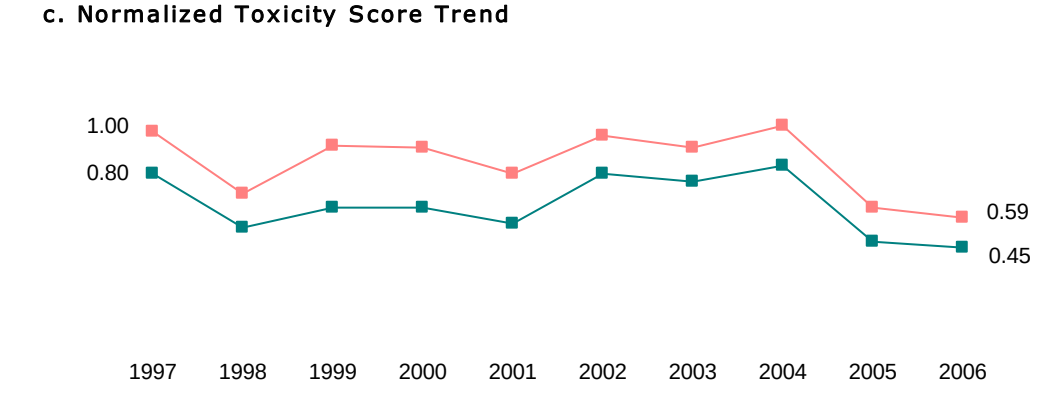
Notes:
1. Total reported sector air releases: 2.1 million lbs.
2. 59 total TRI reporters in the sector.
3. Red indicates that the chemical was one of the top five chemicals reported in the given category.
4. *Italics* indicate a hazardous air pollutant under section 112 of Clean Air Act.
5. For this sector, EPA's National Emissions Inventory contained no chromium speciation information, therefore, chromium Toxicity Scores were adjusted to using the defualt speciation that assumes 34% of chromium was hexavalent and 66% was trivalent.
6. Chemicals in this list represent 83% of the sector's air emissions.
7. Chemicals in this list represent 91% of the sector's Toxicity Score.
8. 88% of facilities reported emitting one of more chemicals in this list.

Source: U.S. Environmental Protection Agency

FIGURE 1

Air Emissions Reported to TRI 1997-2006





Note:
Normalized by annual value of shipments.

Sources: U.S. Environmental Protection Agency, U.S. Department of Commerce

Waste Generation and Management

Waste Management Reported to TRI

In 2006, facilities in the sector reported managing 9.7 million absolute lbs. of TRI chemicals as waste. When normalized by value of shipments, this was 40% less than in 1997. Figure 2 shows the trends in waste management by the sector. In 2006, 26% of the TRI-reported waste was disposed or released, 38% was recycled, 33% was treated, and 3% was recovered for energy. The 2006 increase in treatment was driven by changes in treated quantities of multiple chemicals by one facility.

In 2006, the sector reported disposing 361,000 lbs. of TRI chemicals to land or transferring the chemicals to offsite locations for disposal. As shown in Table 3, zinc and copper accounted for more than half of the total pounds disposed by the sector.

TABLE 3

Top TRI Disposals 2006

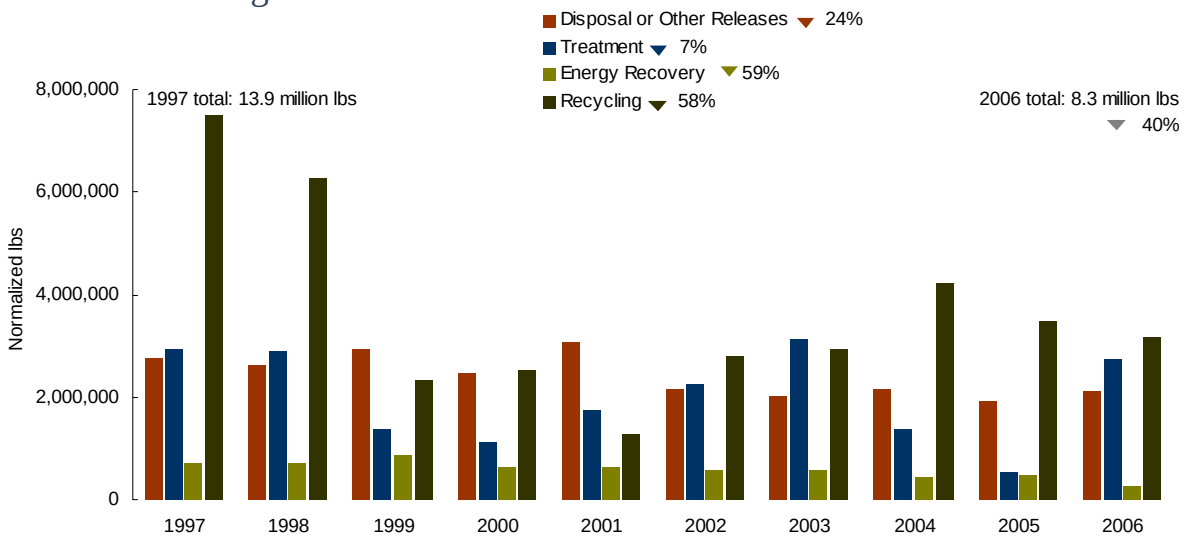
Chemical	Absolute Pounds Reported[1]	Number of Facilities Reporting[2]
Chromium	27,000[3]	14
Copper	86,000	14
Manganese	81,000	10
Nickel	16,000	14
Zinc	113,000	10
Percentage of Sector Total	**90%[4]**	**41%[5]**

Notes:
1. Total reported sector disposals: 360,600 lbs.
2. 59 total TRI reporters in the sector.
3. Red indicates that the chemical was one of the top five chemicals reported in the given category.
4. Chemicals in this list represent 90% of the sector's disposals.
5. 41% of facilities reported emitting one of more chemicals in this list.

Source: U.S. Environmental Protection Agency

FIGURE 2

TRI Waste Management 1997-2006



Notes:
1. Normalized by annual value of shipments.
2. Disposal or other releases include air releases, water discharges, and land disposals.

Sources: U.S. Environmental Protection Agency, U.S. Department of Commerce

APPENDIX: ENDNOTES

Executive Summary

1. Release and waste management quantities of chemicals reported to EPA's Toxics Release Inventory (TRI), 2006 Public Data Release (PDR).

Cement Manufacturing

1. *Facilities:* Portland Cement Association (PCA), *U.S. and Canadian Portland Cement Industry: Plant Information Summary*, December 31, 2006, Executive Summary, p. 1; *Employment:* PCA, U.S. Labor-Energy Input Survey 2006; *Clinker Production:* U.S. Geological Survey (USGS) Mineral Commodity Summaries, 2008, p. 40-41, http://minerals.usgs.gov/minerals/pubs/commodity/cement/index.html.
2. Release and waste management quantities of chemicals reported to TRI, 2006 PDR. This sector is defined by a predetermined list of cement manufacturing facilities.

Chemical Manufacturing

1. *Facilities:* Census Bureau, County Business Patterns (CBP), 2006, http://www.census.gov/epcd/cbp/view/cbpview.html; *Employment:* Census Bureau, CBP, 2006; *Value of shipments:* U.S. Department of Commerce (DOC), Bureau of Economic Analysis (BEA): Industry Economic Accounts, 2006, http://www.bea.gov/industry/gdpbyind_data.htm.
2. Release and waste management quantities of chemicals reported to TRI, 2006 PDR. This sector is defined by NAICS code 325 or SIC code 28.

Food & Beverage Manufacturing

1. *Facilities:* Census Bureau, CBP, 2006, http://www.census.gov/epcd/cbp/view/cbpview.html; *Employment:* Census Bureau, CBP, 2006; *Value of shipments:* U.S. DOC, BEA: Industry Economic Accounts, 2006, http://www.bea.gov/industry/gdpbyind_data.htm.
2. Release and waste management quantities of chemicals reported to TRI, 2006 PDR. This sector is defined by NAICS codes 311 and 3121 or SIC codes 20 and 5461.

Forest Products

1. *Facilities:* Census Bureau, CBP, 2006, http://www.census.gov/epcd/cbp/view/cbpview.html; *Employment:* Census Bureau, CBP, 2006; *Value of shipments:* U.S. DOC, BEA: Industry Economic Accounts, 2006, http://www.bea.gov/industry/gdpbyind_data.htm.
2. Release and waste management quantities of chemicals reported to TRI, 2006 PDR. Forest (Wood) Products defined by NAICS codes 3211, 3212, 32191, 32192, 321999 or SIC codes 242, 243, 244, 249; and Forest (Paper) Products defined by NAICS codes 3221, 32221, 322221-322224, 322226, 32223, 32229 or SIC code 26.

Iron & Steel

1. *Facilities:* USGS, Mineral Commodity Summaries, Iron and Steel, http://minerals.usgs.gov/minerals/pubs/commodity/iron_&_steel/. Some apparent shifts in facility totals over time are attributable to changes in data sources and in methodology used for estimation. The reported facility total for 2004, which was apparently anomalous, is not included in the trend line presented in this report.; *Employment:* Census Bureau, CBP, 2006, defined by NAICS code 331111, http://www.census.gov/epcd/cbp/view/cbpview.html; *Production*: USGS, Mineral Commodity Summaries, http://minerals.usgs.gov/minerals/pubs/commodity//iron_&_steel/index.html.
2. Release and waste management quantities of chemicals reported to TRI, 2006 PDR. This sector is defined by a predetermined list of iron and steel production mills.

Metal Casting

1. *Facilities:* Census Bureau, CBP, 2006, http://www.census.gov/epcd/cbp/view/cbpview.html; *Employment:* Census Bureau, CBP, 2006; *Ferrous and Nonferrous Shipments:* American Foundry Society (AFS), Metal Casting Forecast & Trends; Stratecasts, Inc., Demand & Supply Forecast.
2. Release and waste management quantities of chemicals reported to TRI, 2006 PDR. This sector is defined by NAICS codes 33151 and 33152 or SIC codes 332 and 336.

Oil & Gas

1. *Refineries:* U.S. Department of Energy (DOE), Energy Information Administration (EIA), Refinery Capacity Report, Table 1, January 2008, http://www.eia.doe.gov/pub/oil_gas/petroleum/data_publications/refinery_capacity_data/current/table1.pdf, trend data for 1998 were not available; *Employment:* U.S. Department of Labor, Bureau of Labor Statistics, http://data.bls.gov/PDQ/outside.jsp?survey=ce; *Crude Oil Inputs into Refineries:* U.S. DOE, EIA, Petroleum Refining & Processing, Weekly Inputs, Utilization & Production, http://tonto.eia.doe.gov/dnav/pet/pet_pnp_wiup_dcu_nus_w.htm, estimated by multiplying the average weekly inputs (barrels/day) by seven (days/week), and summing all weeks in the calendar year.
2. Release and waste management quantities of chemicals reported to TRI, 2006 PDR. This sector is defined by NAICS code 32411 or SIC code 2911.
3. Although EIA data indicate 149 refineries, the number of facilities in SIC 2911 (Petroleum Refineries) included in the TRI databases exceed this count. This could be the result of numerous factors, such as: (1) there are differences in how EIA defines the sector and how the sector is defined by SIC code 2911, and (2) TRI counts reflect the number of IDs in the data system; some facilities may inadvertently report under multiple IDs within the data system.

Paint & Coatings

1. *Facilities:* Census Bureau, CBP, 2006, http://www.census.gov/epcd/cbp/view/cbpview.html; *Employment:* Census Bureau, CBP, 2006; *Quantity of paint and allied product shipments:* U.S. Census Bureau, Current Industrial Reports (CIR), 2006, http://www.census.gov/industry/1/ma325f06.pdf.
2. Release and waste management quantities of chemicals reported to TRI, 2006 PDR. This sector is defined by NAICS code 32551 or SIC code 2851.

Shipbuilding & Ship Repair

1. *Facilities:* Beth Gearhart, U.S. Maritime Administration, personal communication with Shana Harbour, EPA, December 2005; *Employees:* Census Bureau, CBP, 2006, http://www.census.gov/epcd/cbp/view/cbpview.html; *Value of Shipments:* U.S. DOC, BEA: Industry Economic Accounts, 2006, http://www.bea.gov/industry/gdpbyind_data.htm.
2. Release and waste management quantities of chemicals reported to TRI, 2006 PDR. This sector is defined by NAICS code 336611 or SIC code 3731.

United States Environmental Protection Agency
Sector Strategies Division
Office of Cross Media Programs (1807T)
February 2009