

# 2009 Toxics Release Inventory National Analysis Overview



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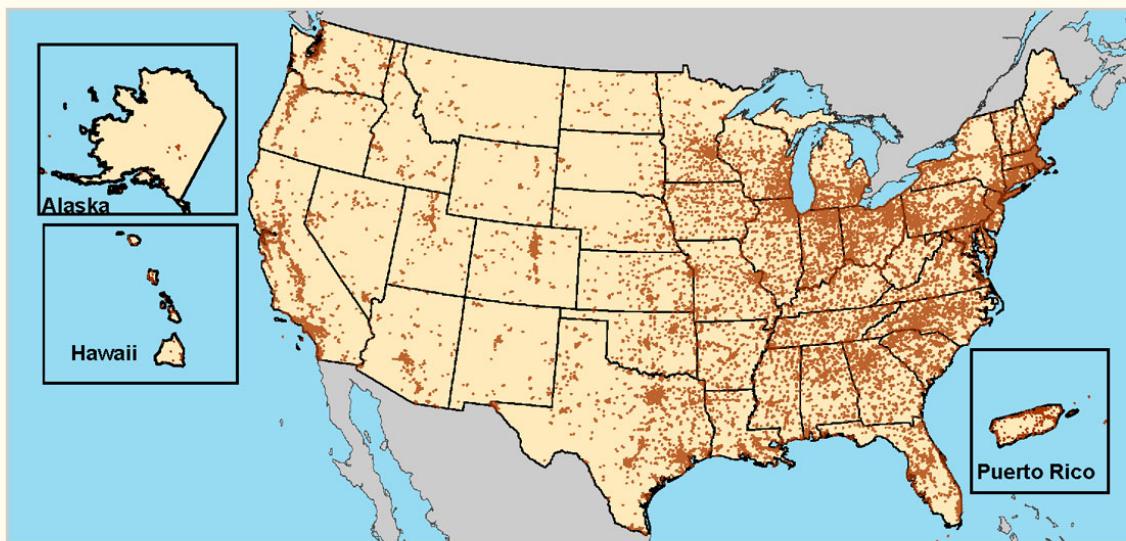


# Introduction: What is the TRI National Analysis?

Approximately 75,000 chemicals are used by industries and businesses in the United States to make the products that our society depends upon, such as pharmaceuticals, clothing, and automobiles. Many of the chemicals needed to create these products are toxic; therefore, some releases of toxic chemicals into the environment are inevitable.

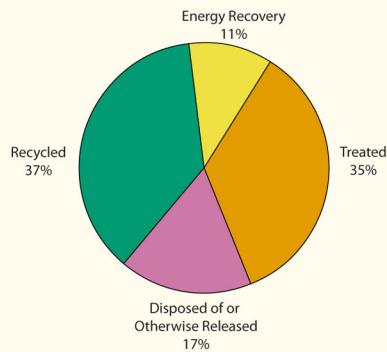
The Toxics Release Inventory (TRI) is a database that contains detailed information on disposal or other releases of over 650 chemicals from the thousands of U.S. facilities that report to TRI (see Figure 1). It also includes information on how the facilities manage chemicals through recycling, energy recovery and treatment. Facilities reporting to TRI are typically larger facilities involved in manufacturing, metal mining, electric power generation, and commercial hazardous waste treatment. Many federal facilities are also required to report to TRI. The 2009 TRI National Analysis provides the public with valuable information on how toxic chemicals were managed, where toxic chemicals ended up, and how 2009 compares to previous years.

**Figure 1. Geographic Distribution of TRI-Reporting Facilities**

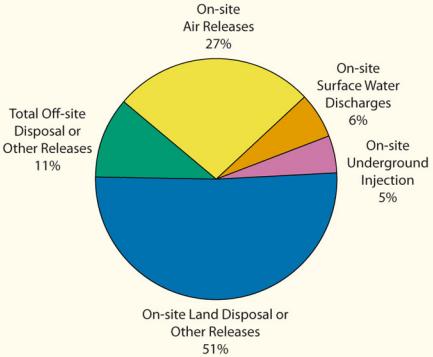


Users of TRI data should be aware that TRI captures a significant portion of toxic chemicals in wastes that are managed by industrial facilities, but it does not cover all toxic chemicals or all sectors of the U.S. economy. Furthermore, the quantities of chemicals reported to TRI are self-reported by facilities and are often estimates. Each year EPA conducts an extensive in-house data quality analysis before publishing the National Analysis. During the data quality analysis the most recent reports are screened for outliers and forms with potential errors are identified to help provide the most accurate and useful information possible. This effort along with others make it possible for TRI data presented in the National Analysis to be used along with other information as a starting point in understanding how the environment and communities may be exposed to toxic chemicals. The data used in the National Analysis are a snapshot of the data at one point in time. Revisions and submissions continue to come into EPA after the reporting deadline that may affect overall trends in some of the analyses. The most up-to-date data is available in the TRI tools listed at the end of this document.

**Figure 2. Production-Related Waste Managed, 2009**  
20.08 billion pounds



**Figure 3. TRI Disposal or Other Releases, 2009**  
3.37 billion pounds



## Quick Facts for 2009

**Number of TRI Facilities:** 20,797

**Production-Related Waste Managed:**  
20.08 billion lbs

- Recycled: 7.36 billion lbs
- Energy Recovery: 2.24 billion lbs
- Treated: 7.06 billion lbs
- Disposed of or Otherwise Released: 3.42 billion lbs

**On-site and Off-site Disposal or Other Releases:** 3.37 billion lbs

- On-site:** 3.00 billion lbs
- Air: 0.91 billion lbs
  - Water: 0.20 billion lbs
  - Land: 1.71 billion lbs
  - Underground Injection: 0.17 billion lbs

**Off-site:** 0.37 billion lbs

In 2009, 20,797 facilities reported to TRI. Together they generated 20.08 billion pounds of toxic chemicals in production-related wastes. Of this total, 16.66 billion pounds were recycled, burned for energy recovery, or treated, and 3.42 billion pounds were disposed of or otherwise released to the environment, as shown in Figure 2.

While disposal or other releases in production-related waste managed focuses on waste management and counts a waste as many times as it is managed during the year, total on- and off-site disposal or other releases focuses on the ultimate disposition of a chemical. Of the 3.37 billion pounds of toxic chemicals reported to be disposed of or otherwise released in 2009, most were disposed of or otherwise released to land, air or water, or injected underground. Significantly fewer pounds of chemicals were sent off site for disposal or other releases, as shown in Figure 3.

In this National Analysis Overview, general information is presented on the quantities and types of TRI chemicals in waste nationally in 2009, and these quantities are compared to those reported in previous years. Additionally several of the industry sectors and companies reporting the largest quantities of toxic chemicals in waste are highlighted. EPA's TRI Program provides much more detail on the 2009 TRI data as well as a variety of tools and resources to help you find information specific to your interests and communities. These include geographic profiles that focus on individual communities, tribal lands, and large aquatic ecosystems. Links to all of these resources can be found in the TRI Tools and Resources Section at the end of this document.

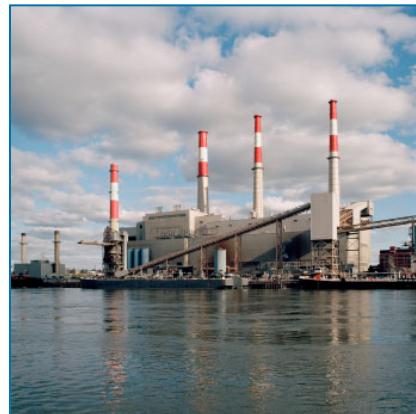
# Trends in Disposal or Other Releases of TRI Chemicals

Disposal or other releases of chemicals into the environment occur through a range of practices that could ultimately affect human exposure to the toxic chemicals. They may take place on a facility as an on-site disposal or other release to air, water, land or underground injection well; or they may take place in an off-site location when a facility transfers its waste containing TRI chemicals as an off-site disposal or other release.

Evaluating disposal and other releases can help the public identify potential concerns and gain a better understanding of possible hazards concerning TRI chemicals. It can also help identify priorities and opportunities for government to work with industry to reduce toxic chemical disposal or other releases and potential risks associated with them.

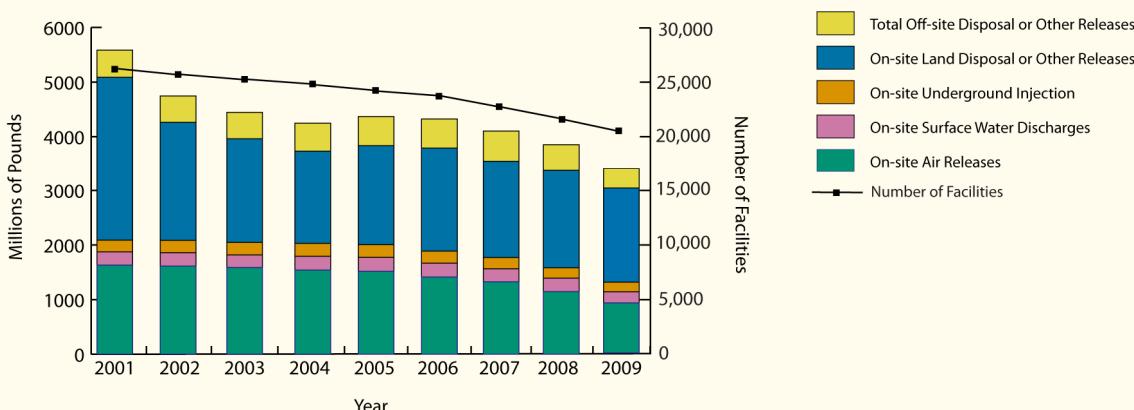
Figure 4 shows that facility disposal or other releases of TRI chemicals decreased over the years: down 12% from 2008 to 2009 and down 40% from 2001 to 2009.

There was also a 7% reduction in the number of facilities reporting to TRI from 2008 to 2009.



Recent decreases in disposal or other releases may be due to a variety of reasons including decreases in production; a reduction in chemical use; a shift to other management methods, such as recycling and treatment of chemicals, which reduces the amounts disposed of or otherwise released; a gradual decrease in the number of facilities reporting to TRI; or a change in the composition of raw materials including ore composition at metal mines. Longer term reductions may be due to these reasons in addition to the metal mining sector responding to rulings in court cases such as *Barrick Goldstrike Mines, Inc. v. Whitman* (Civ. Action No. 99-958 (TPJ)).

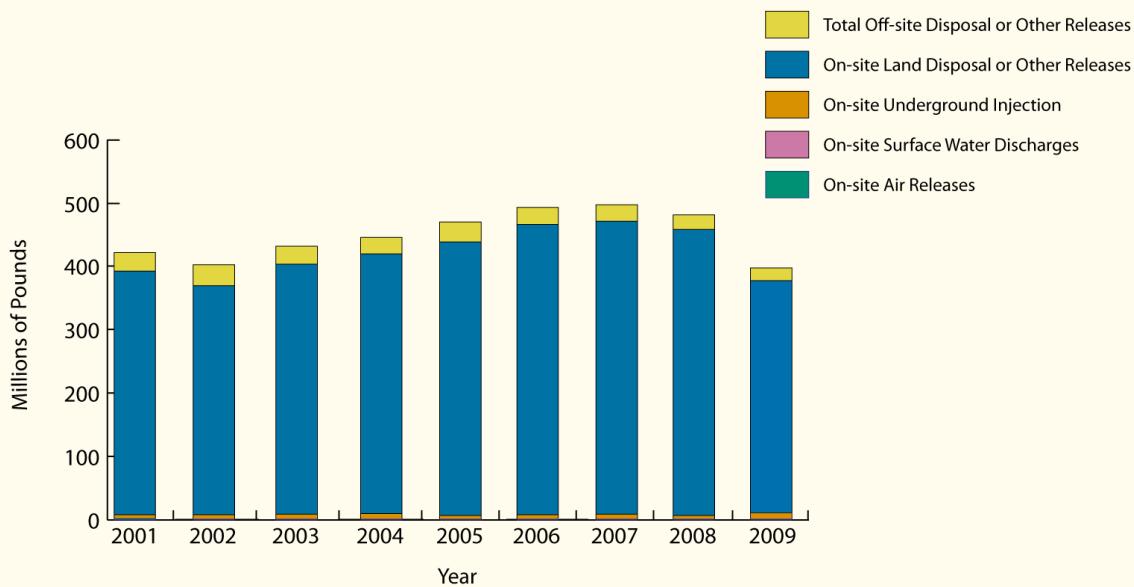
**Figure 4. On- and Off-site Disposal or Other Releases, 2001-2009**



Some of the chemicals on the TRI chemical list have been designated as persistent, bioaccumulative, and toxic (PBT) chemicals. PBT chemicals are of particular concern not only because they are toxic, but also because they remain in the environment for long periods of time, and they tend to build up, or bioaccumulate, in the tissue of organisms. Here we look more closely at several PBT chemicals of particular interest: lead and lead compounds, mercury and mercury compounds, dioxin and dioxin-like compounds and pesticides.

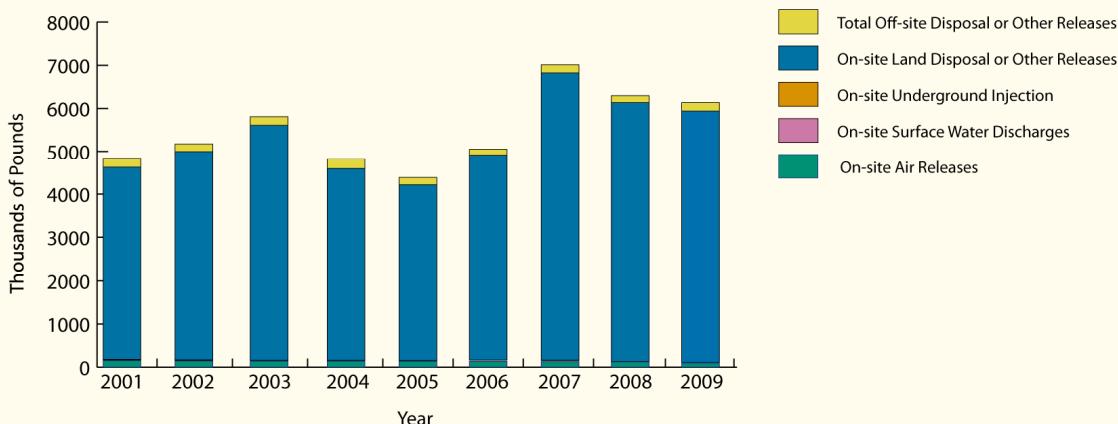
Reflecting its widespread use in industrial processes and products, lead and lead compounds account for the vast majority (97%) of the disposal or other releases of PBT chemicals. The quantities of lead and lead compounds disposed of or otherwise released rose and fell between 2001 and 2009, as shown in Figure 5, with a significant reduction occurring from 2008 to 2009 (18%).

**Figure 5. Disposal or Other Releases, 2001-2009:  
Lead and Lead Compounds**



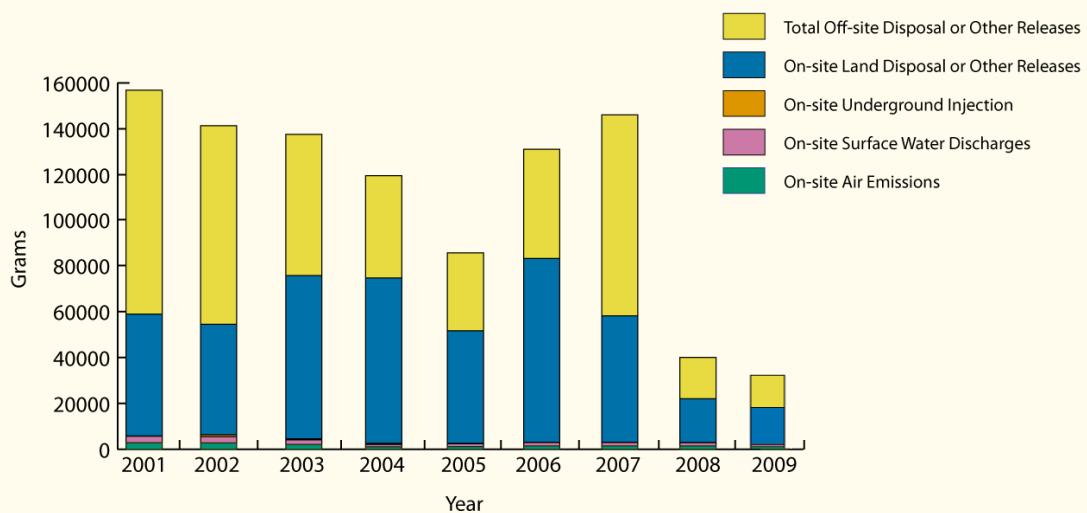
Mercury, another PBT chemical of concern, has traditionally been used to make products like thermometers, switches, and some light bulbs, but it is also found in many naturally occurring ores and minerals, including coal. In the United States, coal-burning power plants are the largest source of mercury emissions to the air, and electric utilities, which include coal- and oil-fired power plants, accounted for 71% of total mercury air emissions reported to TRI in 2009. Over 95% of the on-site land disposal of mercury came from metal mines. Disposal or other releases of mercury and mercury compounds, shown in Figure 6, decreased by 3% from 2008 to 2009; however, since 2001, disposal or other releases increased by 27%. On the other hand, releases to air dropped by 21% from 2008 to 2009 and by 35% since 2001.

**Figure 6. Disposal or Other Releases, 2001-2009:  
Mercury and Mercury Compounds**



Dioxin and dioxin-like compounds (dioxins) are not only PBTs but are also characterized by EPA as likely to be human carcinogens and are thought to increase the risk of cancer even at background levels of exposure. Dioxins are the unintentional by-products of most forms of combustion and several industrial chemical processes. Figure 7 shows the amount of dioxins disposed of or otherwise released in total grams. Disposal or other releases of dioxins decreased 18% from 2008 to 2009 and 79% from 2001 to 2009.

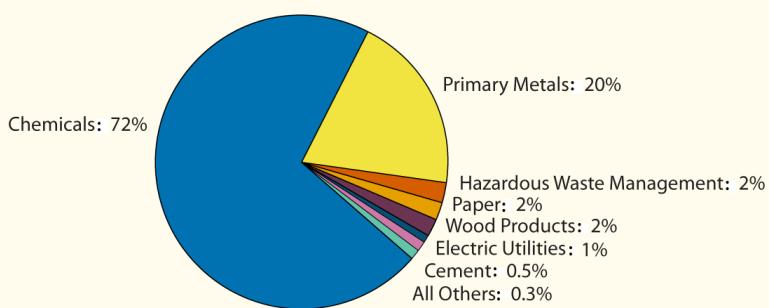
**Figure 7. Disposal or Other Releases, 2001-2009:  
Dioxin and Dioxin-like Compounds**



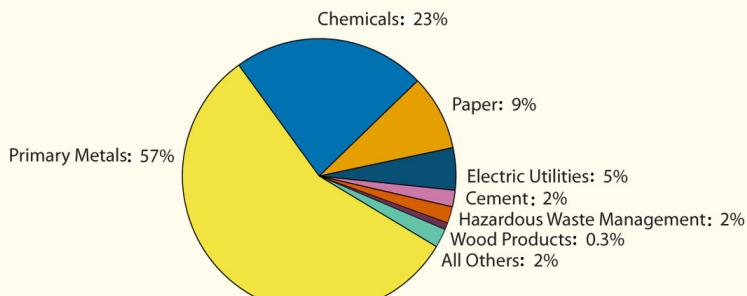
TRI requires facilities to report on 17 dioxin and dioxin-like compounds (or congeners). These congeners have a wide range of toxicities. The mix of dioxins from one source can have a very different level of toxicity than the same total amount, but different mix, from another source. These varying toxicities can be taken into account with Toxic Equivalency Factors (TEFs), which are based on each congener's toxicity data. The total grams of each congener can be multiplied by its TEF to obtain a toxicity weight. The results can then be summed for a total of grams in toxicity equivalents (TEQ).

Analyzing dioxins in grams-TEQ is useful when comparing disposal or other releases of dioxin from different sources, or different time periods, where the mix of congeners may vary. EPA only recently began collecting comprehensive data on the individual dioxin congeners, and currently has two years of data; so, trends of TRI dioxin data in grams-TEQ are not possible at this time. Various industry sectors may dispose of or otherwise release very different mixes of dioxin congeners. Seven industry sectors accounted for most of both the grams and grams-TEQ of dioxin disposed of or otherwise released in 2009; however, their ranking in terms of percentage of the total is quite different for grams and grams-TEQ, as shown in Figures 8 and 9.

**Figure 8. Grams**  
**Percent of Total Disposal or Other Releases,**  
**Dioxin and Dioxin-like Compounds, 2009**



**Figure 9. Grams - TEQ**  
**Percent of Total Disposal or Other Releases,**  
**Dioxin and Dioxin-like Compounds, 2009**

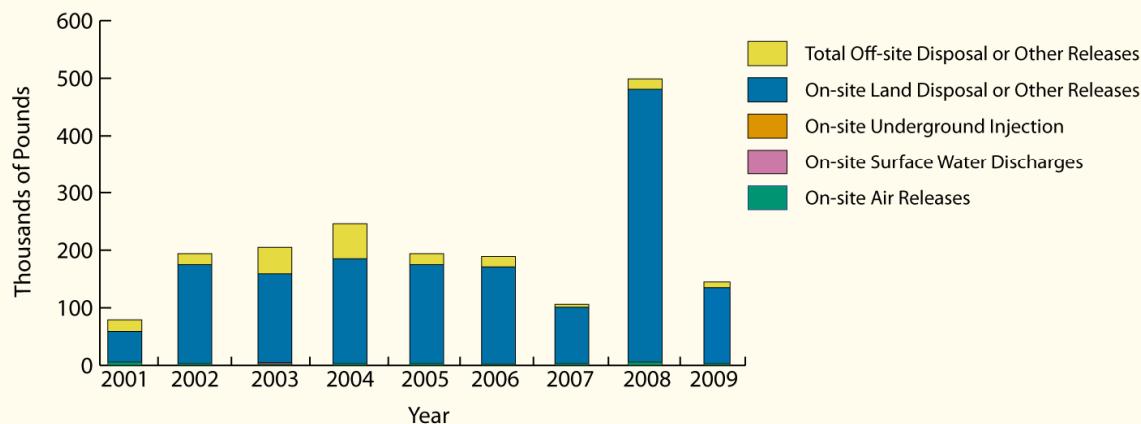


In 2009, the chemical manufacturing industry accounted for 72% of the total grams of dioxin and dioxin-like compounds disposed of or otherwise released, while the primary metals sector accounted for 20% of the total grams. However, when TEFs are applied, the primary metals sector accounted for 57% of the total grams-TEQ and the chemical manufacturing industry for 23% of the total grams-TEQ.

Eight of the TRI PBT chemicals are pesticides: aldrin, chlordane, heptachlor, isodrin, methoxychlor, pendimethalin, toxaphene, and trifluralin. Disposal or other releases of these pesticides, shown in Figure 10, decreased by 71% from 2001 to 2009. In 2008, one hazardous waste management facility reported a large amount of toxaphene disposed of in an on-site RCRA Subtitle C landfill. This facility did not report any toxaphene for 2009. Pendimethalin had the largest total disposal or other releases in the other years. Note that there are about 180 TRI pesticide chemicals in all, but only these eight are classified as PBTs.

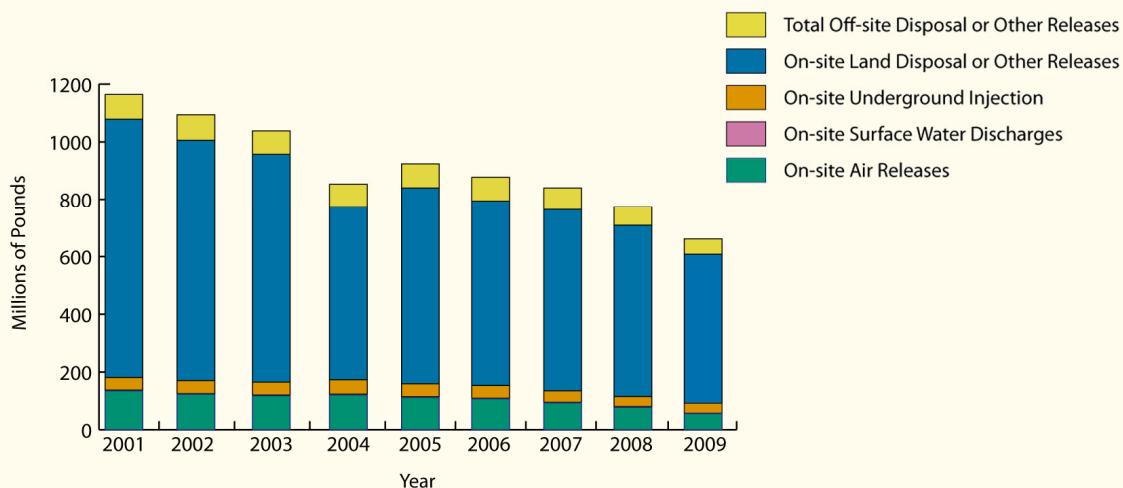


**Figure 10. Disposal or Other Releases, 2001-2009:**  
**PBT Pesticides**



Among the chemicals that are reported to TRI, there are about 180 known or suspected carcinogens, which EPA sometimes refers to as Occupational Safety & Health (OSHA) carcinogens. Figure 11 shows that the total disposal or other releases of these carcinogens decreased 43% between 2001 and 2009 and by 15% from 2008 to 2009. Most of these carcinogens (78%) were disposed of or released on-site to land. On-site air releases of carcinogens decreased more rapidly than other disposal or other releases, with a 59% reduction from 2001 to 2009 and a 28% reduction from 2008 to 2009.

**Figure 11. Disposal or Other Releases, 2001-2009:  
Carcinogens**

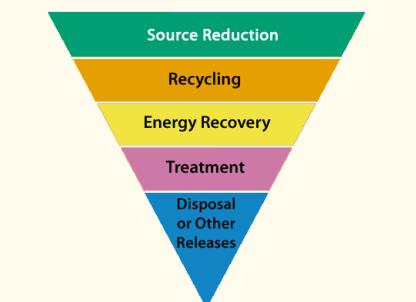


# Trends in Management of TRI Chemicals

In addition to collecting information on the disposal or otherwise release of chemicals to the environment, TRI collects information on the quantities of toxic chemicals recycled, combusted for energy recovery, and treated both on- and off-site. This production-related waste includes the total amounts of toxic chemicals in waste managed by facilities, which helps track industry progress in reducing waste generation and moving towards safer waste management alternatives.

Looking at production-related waste over time also allows us to focus on management of toxic chemicals rather than only on their final disposition. Proper waste management techniques are key to reducing the human health and environmental risks associated with toxic chemicals. The waste management hierarchy, shown in Figure 12, established in the Pollution Prevention Act of 1990, encourages facilities to first eliminate waste at its source. However, for waste that is generated, the preferred management methods are recycling, followed by burning for energy recovery, treating and, as a last resort, disposing of or otherwise releasing the waste. The hope is that, when possible, waste management techniques will shift over time from disposal or other releases toward the more preferred techniques in the waste management hierarchy.

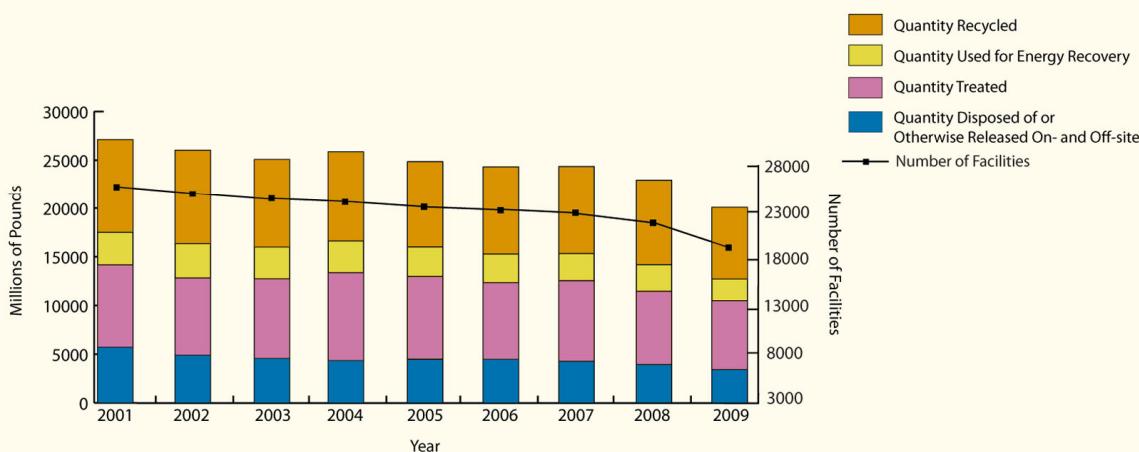
Figure 12. Waste Management Hierarchy



Facilities may be adopting source reduction activities that are resulting in fewer pounds of TRI chemicals in their waste. As shown in Figure 13, from 2001 to 2009, total production-related waste managed by TRI facilities declined by 26% (more than 7 billion pounds) and from 2008 to 2009, the total production-related waste decreased 12%. Also, the quantities of TRI chemicals managed using each of the other methods in the waste management hierarchy have declined since 2008. Facilities reduced the quantity of TRI chemicals:

- recycled by 16%
- recovered for energy by 18%
- treated by 6% and
- disposed of or otherwise released by 13%.

Figure 13. Production-Related Waste Managed, 2001-2009

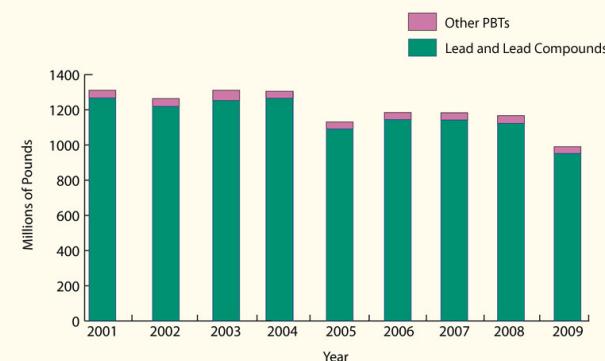


Production-related waste can increase or decrease due to various factors, such as changes in operations that alter the chemicals used, the adoption of pollution prevention or control activities, or changes in business activity. One measure of business activity is the production index, which measures how production levels change over time for a particular industry sector. EPA uses production indices from the Bureau of Labor Statistics as an estimate of business activity for individual industry sectors.

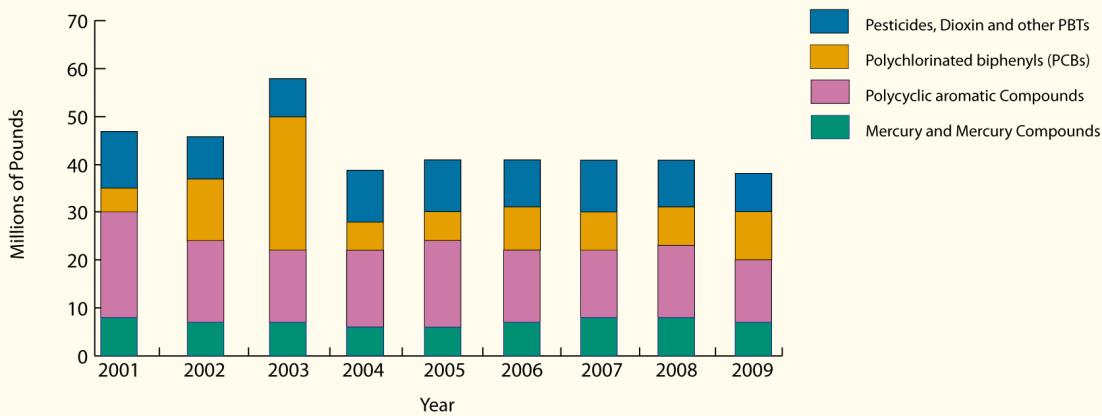
The manufacturing sector in the United States increased production levels each year from 2001 to 2007 by an average of about 3%. However, from 2007 to 2008 production levels decreased 5% and from 2008 to 2009 they decreased another 12%. On the other hand, manufacturing facilities reporting to TRI showed an average decrease of 1% in total production-related waste from 2001 to 2007, a decrease of 6% from 2007 to 2008 and a decrease of 14% from 2008 to 2009. More information on the production index for each sector can be found in the “Industry Sector Profiles” section of this document.

Taking a closer look at chemicals of interest, facilities managed almost 990 million pounds of PBT chemicals in production-related waste in 2009. Lead and lead compounds accounted for 96% (952 million pounds) of that amount. Mercury and mercury compounds, polycyclic aromatic compounds (PACs), polychlorinated biphenyls (PCBs), certain pesticides, dioxin and dioxin-like compounds and other chemicals made up the remainder. Figure 14 shows that the quantities of PBT chemicals managed in wastes have risen and fallen over the years, but showed an overall reduction of 25% since 2001 and 15% from 2008 to 2009. Figure 15 focuses only on PBTs other than lead. The amount of these chemicals in production-related waste was 14% lower in

**Figure 14. Total Production-Related Waste Managed, 2001-2009: All PBT Chemicals**



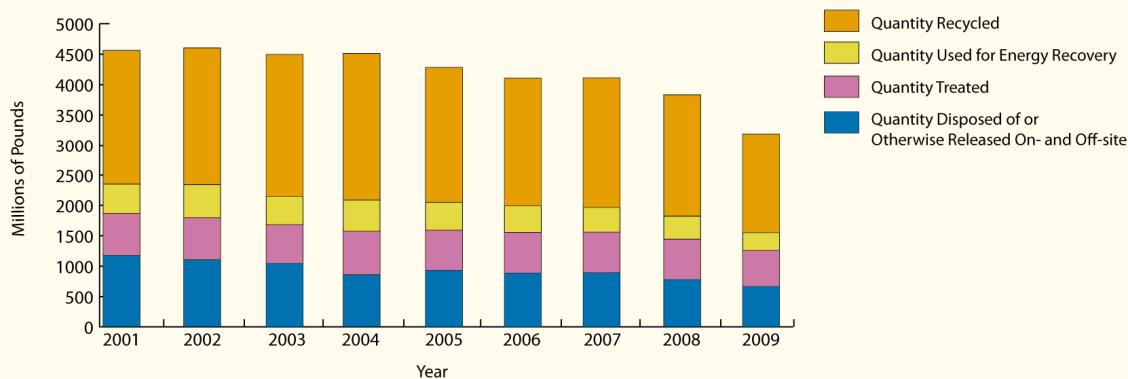
**Figure 15. Total Production-Related Waste Managed, 2001-2009: Non-Lead PBT Chemicals**



2009 compared to 2008. This reduction is similar to the reduction for total PBTs, but it accounted for almost all of the reduction in non-lead PBTs since 2001 (15%). To learn more about what EPA has done to increase public access to information about PBTs in the TRI Program, visit [www.epa.gov/tri/lawsandregs/pbt/pbtrule.htm](http://www.epa.gov/tri/lawsandregs/pbt/pbtrule.htm).

Facilities managed almost 3.19 billion pounds of carcinogens in production-related waste in 2009. The quantities of carcinogens managed as waste at TRI facilities decreased by 30% between 2001 and 2009 and by 17% from 2008 to 2009 (Figure 16). Just over half of these carcinogens (51%) were recycled. Another 9% was used for energy recovery, 18% was treated, and 21% was disposed of or otherwise released.

**Figure 16. Production-Related Waste Managed, 2001-2009:  
Carcinogens**



The significant drop in total amounts of TRI chemicals managed as wastes since 2001 is in part due to many facilities and industry sectors embracing source reduction and pollution prevention in their operations. These are positive efforts that benefit both human health and the environment. To learn more about pollution prevention and what EPA is doing to encourage pollution prevention, visit EPA's Pollution Prevention website ([www.epa.gov/p2/](http://www.epa.gov/p2/)).

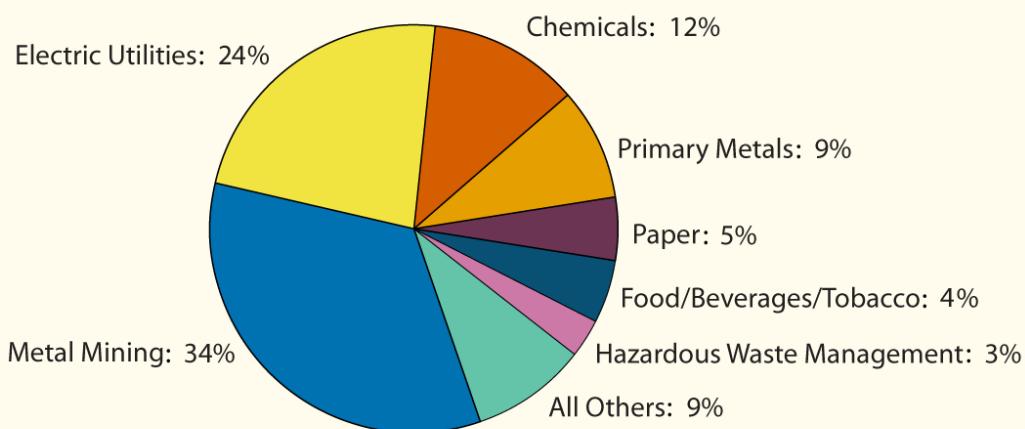


# Industry Sector Profiles

Because individual industry sectors reporting to TRI can vary substantially in size, scope, makeup, relevant drivers and barriers, the amounts and types of toxic chemicals generated and managed by each differs greatly. Within a sector, however, the industrial processes, products, and regulatory requirements are often similar, resulting in similar toxic chemical use and waste generation. Therefore it is useful to look at waste management trends within a sector to identify potential emerging issues. While sector-specific waste management trends can be used as indicators of environmental performance, reflecting changes in management practices or the adoption of pollution prevention and control technologies, it is important to consider the influence that changes in production and the economy have on chemical generation. In this section, EPA uses the production index from the Bureau of Labor Statistics as an estimate of business activity for individual industry sectors.

In 2009, 91% of all disposal or other releases of TRI chemicals originated from just seven of the 26 TRI industry sectors. More than half originated from just two industry sectors: metal mining (34%) and electric utilities (24%) as shown in Figure 17.

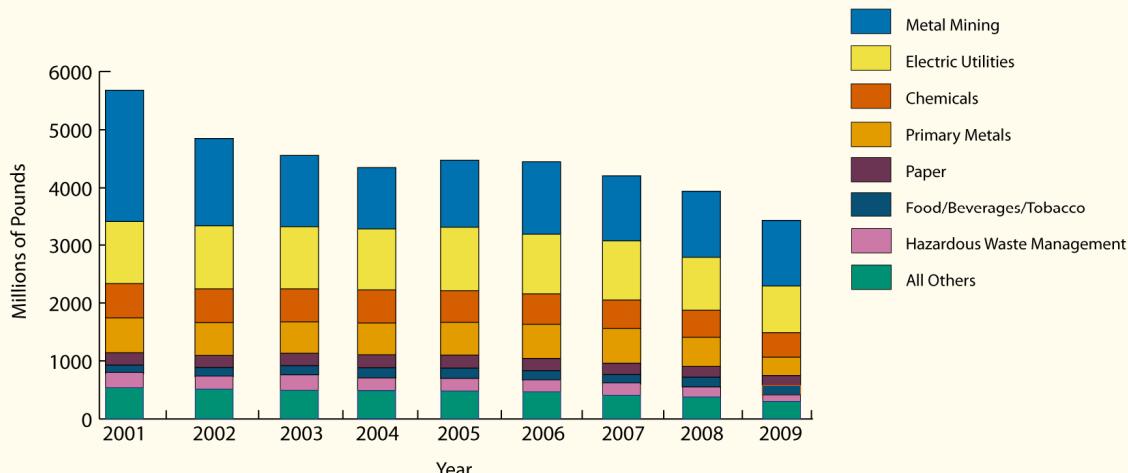
**Figure 17. Disposal or Other Releases by Industry, 2009**



Over time, the amounts and proportions of TRI chemicals disposed of or otherwise released by each industry sector has varied as shown in Figure 18. Total disposal or other releases declined by 40% since 2001 to 3.37 million pounds in 2009. All but one of the seven industry sectors (the food/beverages/tobacco sector) with the largest reported total disposal or other releases fell from their 2001 levels. The greatest percentage decrease over this period was observed in metal mining with a 50% (1.14 billion pounds) decrease from 2001, mostly due to decreases in on-site land disposal. This sector may have been adjusting their reporting in response to a ruling in a court case, *Barrick Goldstrike Mines, Inc. v. Whitman* (Civ. Action No. 99-958 (TPJ)). The decrease could also be due to other factors, such as changes in management practices and changes in ore composition.

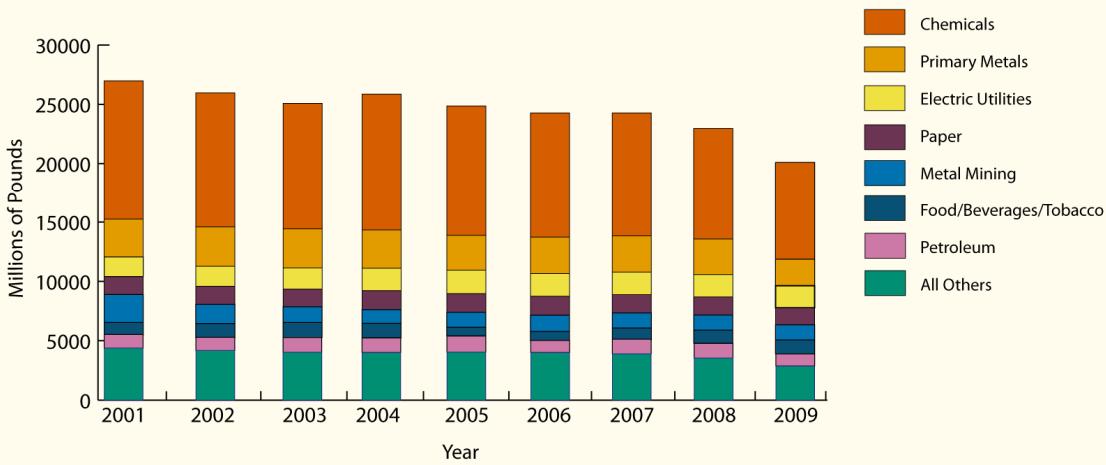
Primary metals had the second largest decrease in disposal or other releases, 48% or 291 million pounds, since 2001 with almost all of this occurring since 2007. Over half of total disposal or other releases from this sector were off-site transfers, which decreased by 147 million pounds. Most of these off-site transfers were to landfills.

**Figure 18. Disposal or Other Releases by Industry, 2001-2009**



As shown in Figure 19, between 2001 and 2009, total production-related waste decreased by 26% (7.02 billion pounds). This included a decrease of 35% (1.52 billion pounds) in the quantity disposed of or otherwise released.

**Figure 19. Production-Related Waste Managed by Industry, 2001-2009**



Most industry sectors reported a decline in total production-related waste from 2001 to 2009:

- Chemical manufacturers, with the largest total production-related waste managed of all industry sectors in all years, decreased by 30%.

- Primary metals sector (which includes smelters and steel mills), with the second largest total production-related waste managed in all years, decreased 31%.
- Metal mining, with the third largest total in 2001 and fifth largest total in 2009, decreased 46%.
- Petroleum sector, which includes petroleum refineries and other petroleum and coal products manufacturing, with the sixth largest total in 2001 and seventh largest total in 2009, decreased 35%.

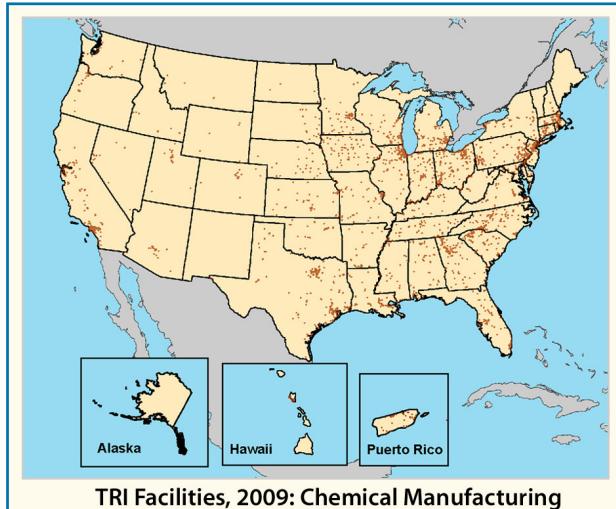


However, some industry sectors showed an increase in total production-related waste managed from 2001 to 2009:

- Electric utilities, with the third largest total for all years except 2001, increased 13%.
- Food/beverages/tobacco sector, with the sixth largest total in 2009, increased 6%.

# Industry Sector Profile: Chemical Manufacturing

## Chemical Manufacturing



Chemical manufacturers that report to TRI produce a variety of products, such as basic chemicals, products used by other manufacturers (such as synthetic fibers, plastics and pigments) and consumer products (such as paints, fertilizers, drugs, cosmetics, and soaps). The sector had the third largest total disposal or other releases for 2009 with a decrease of 28% (165 million pounds) from 2001. Half of the decrease was a reduction in air emissions. The sector accounts for almost 80% of on-site underground injection from all industries.

## Quick Facts for 2009

**Number of TRI Facilities:** 3,460

**Production-Related Waste Managed:** 8,239.1 million lbs

- Recycled: 3,262.7 million lbs
- Energy Recovery: 1,195.1 million lbs
- Treated: 3,348.8 million lbs
- Disposed of or Otherwise Released: 432.5 million lbs

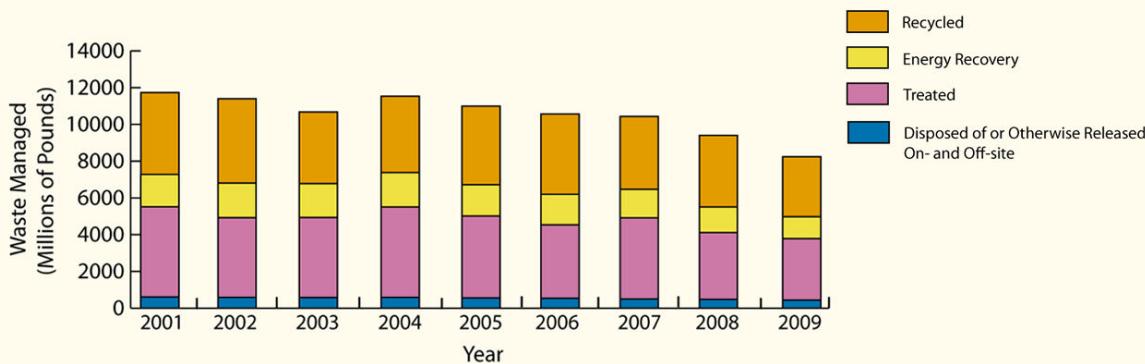
**On-site and Off-site Disposal or Other Releases:** 426.3 million lbs

**On-site:** 72.6 million lbs

- Air: 157.3 million lbs
- Water: 29.0 million lbs
- Land: 48.8 million lbs
- Underground Injection: 137.5 million lbs

**Off-site:** 54.7 million lbs

**Figure 20. Production-Related Waste Managed, 2001-2009: Chemical Manufacturing**

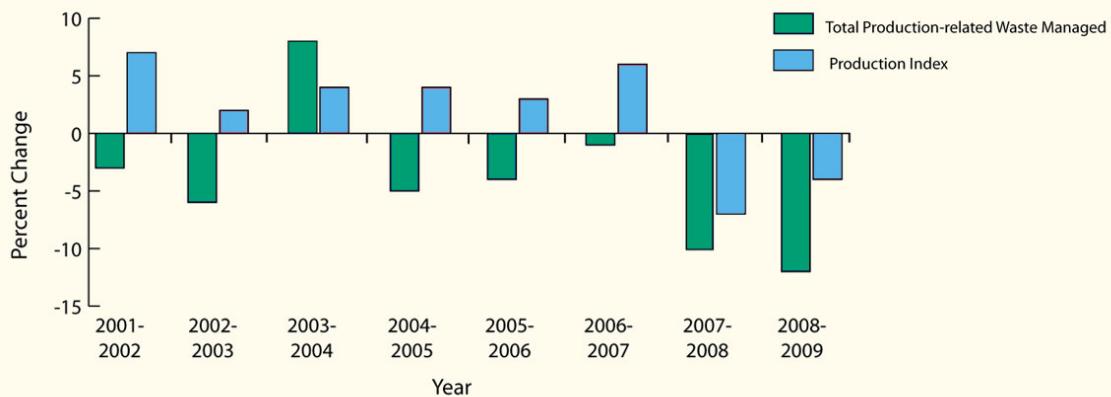


Partly due to the size and scope of the chemical manufacturing sector, it has consistently had the largest production-related waste managed every year since 2001, representing over 40% of the total for all industries. Figure 20 shows that the sector's total production-related waste managed has decreased almost every year since 2001, for an overall decrease of 30%. Similar percentage decreases were seen in all types of waste managed.



Figure 21 compares percent change in production-related waste to percent change in production index to provide information on how business activity compares to the amount of TRI chemicals managed. It shows that the production index levels for this sector increased every year since 2001, except for the last two years.

**Figure 21. Percent Change in Production-Related Waste Managed and Production Index, 2001-2009: Chemical Manufacturing**

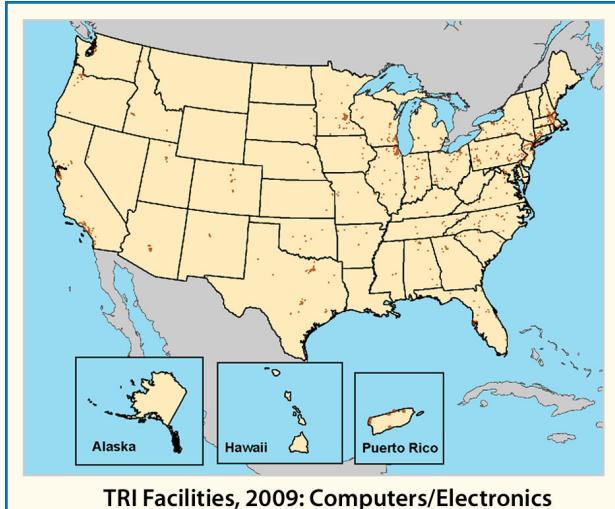


Although the chemical manufacturing sector consistently has the largest production-related waste managed, there are environmental management systems available to enable organizations to reduce their environmental impacts and increase operating efficiency. For example, Society of Chemical Manufacturers & Affiliates' ChemStewards® program is an initiative to manage compliance with federal requirements, improve processes, and boost efficiency. The American Chemistry Council's Responsible Care® program offers a system for managing performance in environmental impact, health, safety, and security.

To learn more about this sector and how it can reduce chemicals generated and improve management practices, visit EPA's Chemical Compliance Assistant website at [www.epa.gov/compliance/assistance/sectors/chemical.html](http://www.epa.gov/compliance/assistance/sectors/chemical.html).

# Industry Sector Profile: Computers/Electronics

## Computers/ Electronics



This sector includes facilities that manufacture computers, computer peripherals, communications equipment, and similar electronic products. It also includes facilities that manufacture components for such products. It ranked eighth among other sectors in number of TRI facilities, but has one of the lowest disposal or other release totals, ranking 19th compared to other sectors in 2009.

### Quick Facts for 2009

**Number of TRI Facilities:** 973

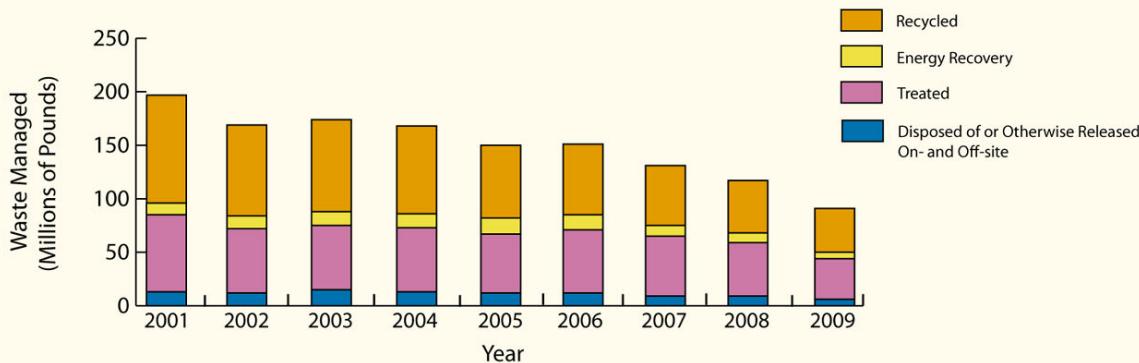
**Production-Related Waste Managed:** 91.4 million lbs

- Recycled: 41.1 million lbs
- Energy Recovery: 6.2 million lbs
- Treated: 37.9 million lbs
- Disposed of or Otherwise Released: 6.2 million lbs

**On-site and Off-site Disposal or Other Releases:** 5.3 million lbs

- On-site:** 3.0 million lbs
- Air: 1.4 million lbs
  - Water: 1.6 million lbs
  - Land: 555 lbs
  - Underground Injection: none
- Off-site:** 2.3 million lbs

**Figure 22. Production-Related Waste Managed, 2001-2009:  
Computers/Electronics**

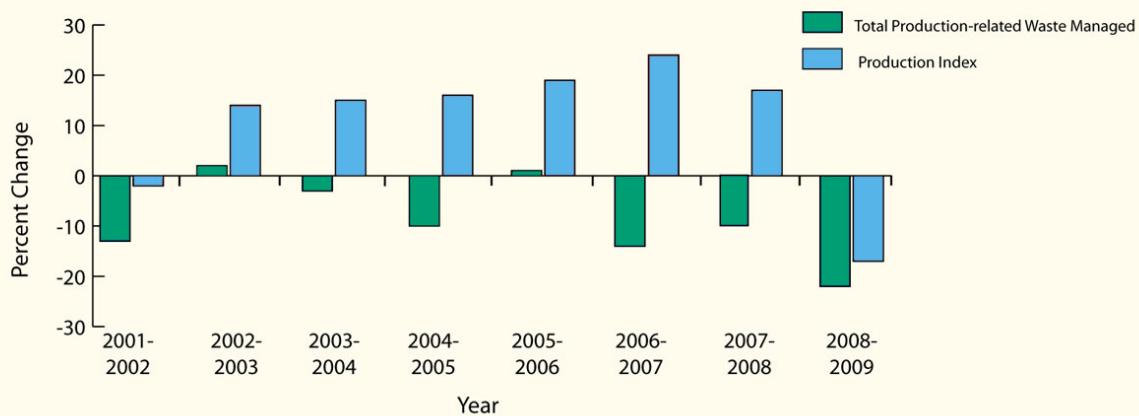


The computer/electronics sector sent over 40% of its total disposal or other releases off-site. Of the on-site disposal or other releases less than one-third were surface water discharges and over one-quarter were air releases.

Computer/electronics manufacturers had the 17th largest production-related waste managed of TRI industry sectors in 2009. As shown in Figure 22, they reported a decrease in total production-related waste managed in every year but two since 2001. These decreases occurred despite large percentage increases in production levels, as shown in Figure 23. Total production-related waste managed dropped 53% from 2001 to 2009, while production levels rose 86%.



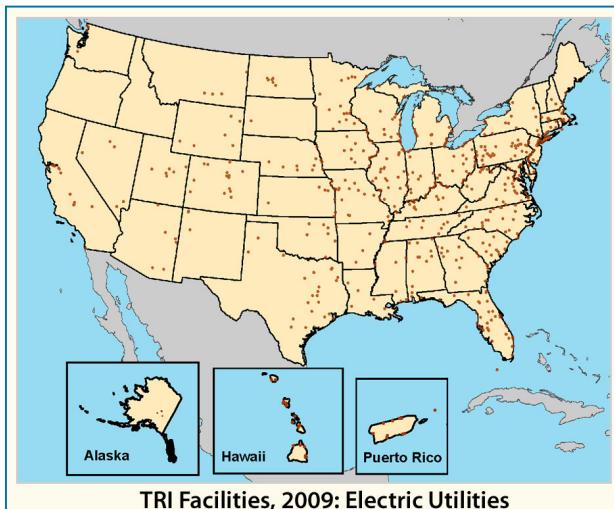
**Figure 23. Percent Change in Production-Related Waste Managed and Production Index, 2001-2009: Computers/Electronics**



To learn more about this sector and how it can continue to reduce chemicals generated, visit EPA's Computer/Electronics Compliance Assistant website at [www.epa.gov/compliance/assistance/sectors/computerelectronics.html](http://www.epa.gov/compliance/assistance/sectors/computerelectronics.html).

# Industry Sector Profile: Electric Utilities

## Electric Utilities



The electric utilities sector consists of establishments primarily engaged in generating, transmitting, and/or distributing electric power. Electric utility facilities may use a variety of fuels to generate electricity; however, only facilities that combust coal and/or oil to generate power for distribution in commerce must report to TRI. These electric utilities reported the second largest disposal or other releases of any industry sector for 2009, including the largest on-site air emissions, which represented over 40% of air emissions from all industries.

## Quick Facts for 2009

**Number of TRI Facilities:** 649

**Production-Related Waste Managed:**  
1,867.1 million lbs

- Recycled: 6.9 million lbs
- Energy Recovery: 0.6 million lbs
- Treated: 1,058.1 million lbs
- Disposed of or Otherwise Released: 801.5 million lbs

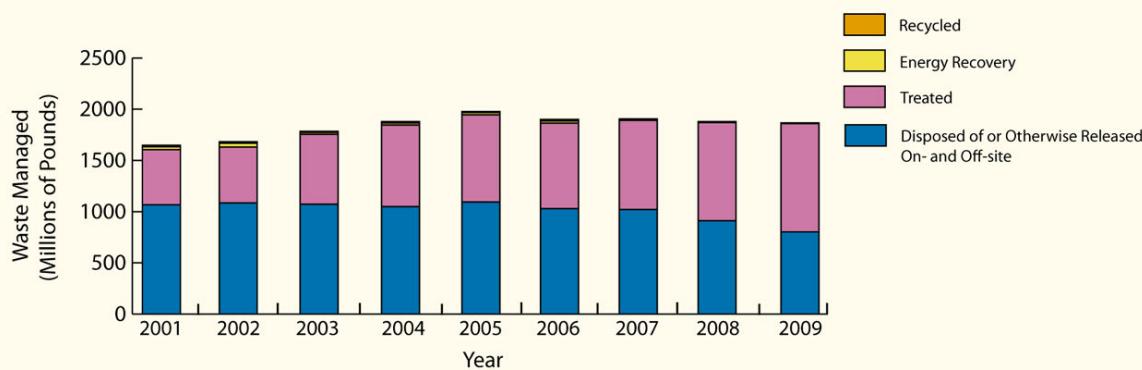
**On-site and Off-site Disposal or Other Releases:** 801.6 million lbs

**On-site:** 730.3 million lbs

- Air: 386.4 million lbs
- Water: 2.6 million lbs
- Land: 341.2 million lbs
- Underground Injection: 27 thousand lbs

**Off-site:** 71.3 million lbs

**Figure 24. Production-Related Waste Managed, 2001-2009:  
Electric Utilities**



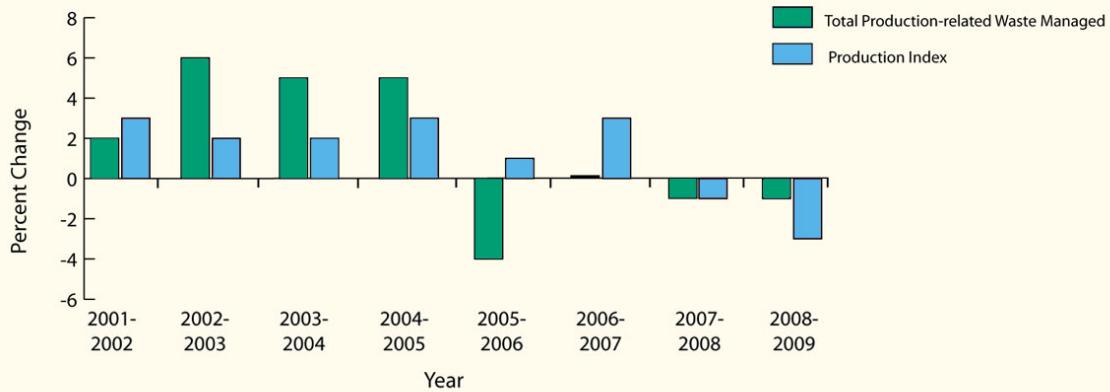
Electric utilities reported the second largest total disposal or other releases for 2001 and 2009 and had a 25% decrease (269 million pounds) over that period. Two-thirds of this sector's disposal or other releases were on-site air emissions, which decreased by 46% (327 million pounds) from 2001 to 2009.

The electric utilities sector had the fourth largest total production-related waste managed for 2001 and third largest for 2009, with an increase of 13% from 2001 to 2009 (see Figure 24). Despite the increase in quantities of waste, most was treated and the quantity disposed of or otherwise released actually decreased by 25%. Almost two-thirds of production-related waste generated by electric utilities in 2001 was disposed of or otherwise released, but this dropped to less than half in 2009.



Figure 25 compares percent change in production-related waste to percent change in the production index to provide information on how business activity compares to the amount of TRI chemicals managed. The production index for electric power generation increased each year from 2001 to 2007 and overall increased by 10% from 2001 to 2009. Total production-related waste managed by TRI electric utilities also increased with annual percent increases from 2001 to 2005 higher than annual percentage increases in the production levels. The production index for electric power generation decreased from 2007 to 2009. Production-related waste also fell during this period but at a lower rate than the decrease in production indices.

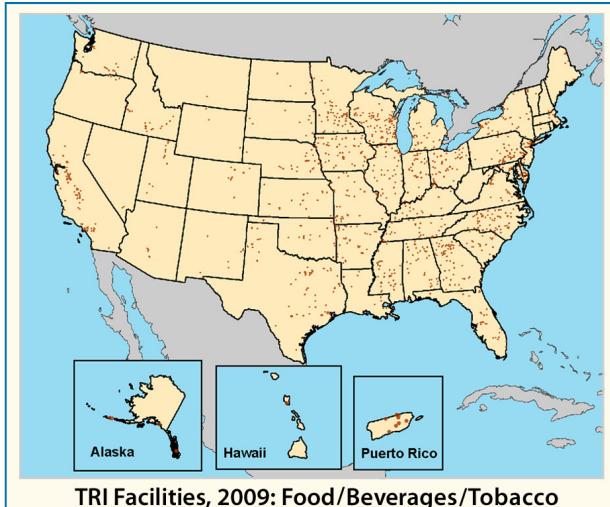
**Figure 25. Percent Change in Production-Related Waste Managed and Production Index, 2001-2009  
Electric Utilities**



To learn more about this sector and how it can reduce chemicals generated and improve management practices, visit EPA's Power Generators Compliance Assistant website at [www.epa.gov/compliance/assistance/sectors/power.html](http://www.epa.gov/compliance/assistance/sectors/power.html).

# Industry Sector Profile: Food/Beverages/Tobacco

## Food/Beverages/ Tobacco



Facilities in this sector use agricultural commodities as inputs for producing food and food ingredients. The sector includes facilities that perform the first stage of processing for all grains and oilseeds; animal production facilities, which process livestock for food, excluding the raising of livestock; and other food production facilities. TRI also includes manufacturers of alcohol, soft drinks and tobacco products in this industry category. The sector is the third largest in value of shipments and in employment of all U.S. manufacturing sectors according to the Census Bureau.

### Quick Facts for 2009

**Number of TRI Facilities:** 1,589

**Production-Related Waste Managed:**  
1,174.6 million lbs

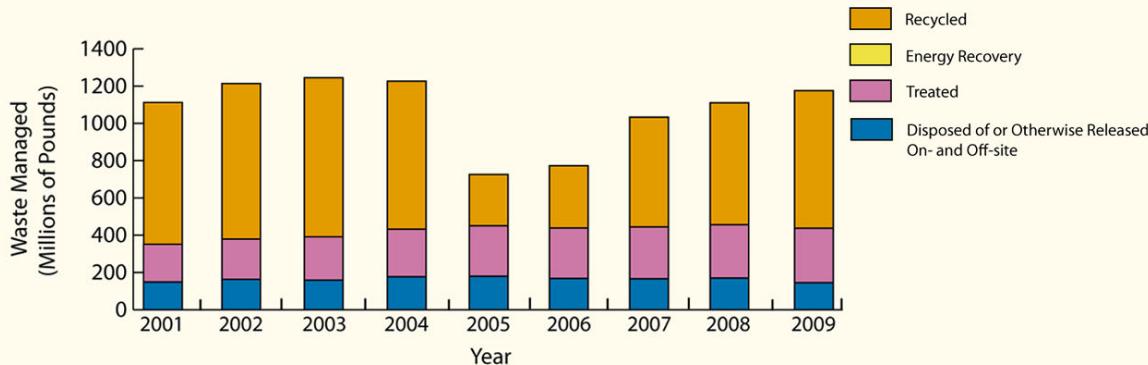
- Recycled: 737.6 million lbs
- Energy Recovery: 0.7 million lbs
- Treated: 291.9 million lbs
- Disposed of or Otherwise Released: 144.4 million lbs

**On-site and Off-site Disposal or Other Releases:** 142.5 million lbs

- On-site:** 134.7 million lbs
- Air: 40.7 million lbs
  - Water: 81.4 million lbs
  - Land: 12.2 million lbs
  - Underground Injection: 0.5 million lbs

**Off-site:** 7.7 million lbs

**Figure 26. Production-Related Waste Managed, 2001-2009:  
Food/Beverages/Tobacco**



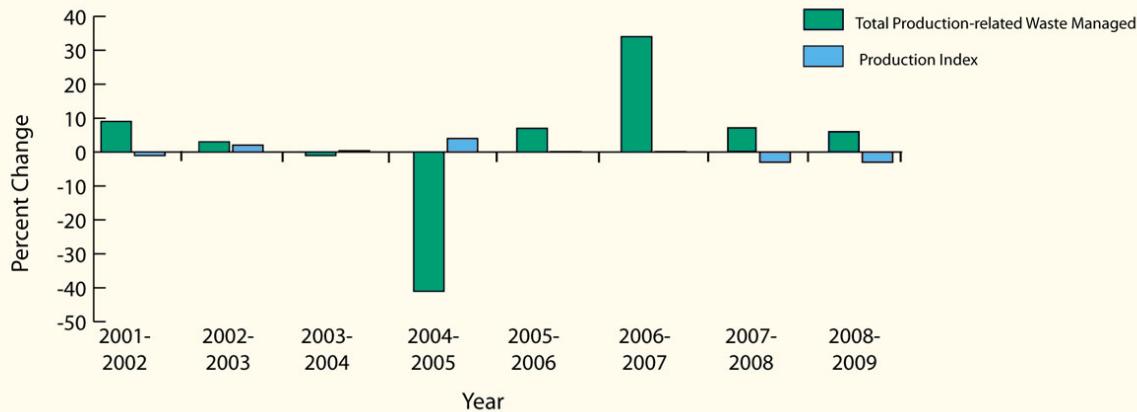
Compared to other TRI industry sectors, the food/beverages/tobacco sector reported the sixth largest total disposal or other releases in 2009. It had the largest surface water discharges of any sector, accounting for 40% of total surface water discharges. Nitrate compounds were the chemicals disposed of or otherwise released in the greatest quantity and were one of the chemicals most frequently reported by this sector.



Food/beverages/tobacco producers had the sixth largest production-related waste managed in 2009, with a steady increase from 2005 to 2009 as shown in Figure 26. Despite these increases, production levels decreased over that time period, as in Figure 27. Overall, from 2001 to 2009, total production-related waste managed increased by 6%, mainly because of increases in the amount of chemicals treated on-site. Other types of waste managed decreased from 2001 to 2009.

One facility reported over half of the total production-related waste managed for the sector in 2009 (shown in Figure 27). It uses n-hexane and methanol in processing soybeans into soybean meal, vegetable oil and bio-diesel fuel. Over 99% of its total production-related waste was recycled on-site. Total production-related waste managed (as chemicals recycled on-site) at the facility in 2009 was over 2.5 times the amount for 2005, and its level of production increased almost 64% from 2005 to 2009.

**Figure 27. Percent Change in Production-Related Waste Managed and Production Index, 2001-2009:  
Food/Beverages/Tobacco**



Manufacturers in this sector are increasingly working with their suppliers to improve the environmental sustainability of agricultural production. Traditionally, their suppliers' efforts have focused on reducing pesticide use through Integrated Pest Management. Projects now include improving water quality as well as reducing soil erosion. Note that the food/beverages/tobacco sector does not include many of the farms that supply the manufacturers in this sector.

To learn more about this sector and how they can reduce chemicals used and waste generated and improve management practices, visit EPA's Food Processing Compliance Assistant website at [www.epa.gov/compliance/assistance/sectors/foodprocessing.html](http://www.epa.gov/compliance/assistance/sectors/foodprocessing.html).

# Industry Sector Profile: Metal Mining

## Metal Mining



The portion of the metal mining sector covered by TRI includes facilities mining for copper, lead, zinc, silver, gold and several other metals. These facilities tend to be in Western states where most of the copper, silver and gold mining occurs, while zinc mining occurs in Tennessee and lead mining in Missouri. Metals generated from U.S. mining operations are used in a wide range of products, including automobiles, electrical and industrial equipment. The extraction and beneficiation of these minerals generate large amounts of waste.

## Quick Facts for 2009

**Number of TRI Facilities:**

81

**Production-Related Waste Managed:**

1,271.7 million lbs

- Recycled: 53.4 million lbs
- Energy Recovery: 26 lbs
- Treated: 85.5 million lbs
- Disposed of or Otherwise Released: 1,132.9 million lbs

**On-site and Off-site Disposal**

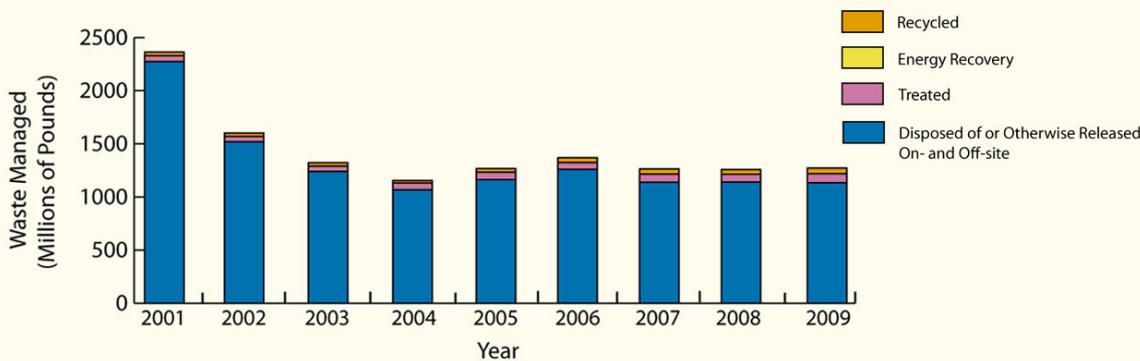
**or Other Releases:** 1,133.8 million lbs

**On-site:** 1,132.3 million lbs

- Air: 3.0 million lbs
- Water: 0.5 million lbs
- Land: 1,102.6 million lbs
- Underground Injection: 26.2 million lbs

**Off-site:** 1.5 million lbs

**Figure 28. Production-Related Waste Managed, 2001-2009:  
Metal Mining**



In 2009, the metal mining sector reported the largest disposal or other releases representing about one-third of the total disposal or other releases for all industries. Additionally, it reported almost two-thirds of the on-site land disposal reported for 2009 for all industries.

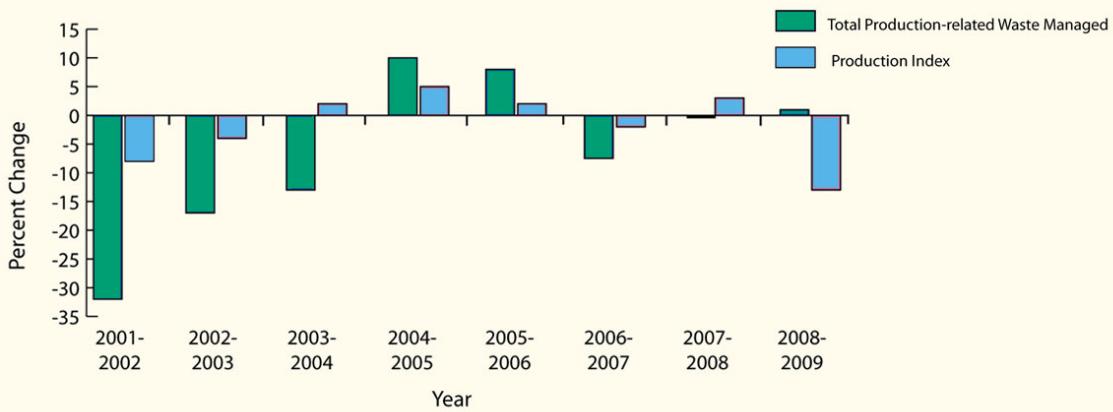
The metal mining sector had the third largest total production-related waste managed in 2001 and fifth largest in 2009, reflecting a decrease from 2001 to 2009 of 46% as

shown in Figure 28. The large decrease in earlier years may reflect adjustments in the industry's reporting in response to a ruling in a court case, *Barrick Goldstrike Mines, Inc. v. Whitman* (Civ. Action No. 99-958 (TPJ)). The decrease could also be due to other factors, such as changes in production and changes in composition of the ore. This sector increased the amount of chemicals in waste recycled and treated by over 50% from 2001 to 2009. However, the quantity disposed of or otherwise released is about 90% of total production-related waste managed for this sector. Despite these large quantities of releases it is also important to note that virtually none of the annual waste generation related to extraction and beneficiation is classified as RCRA hazardous waste. Over 99% of this sector's total disposal or other releases went to on-site non-RCRA Subtitle C landfills or on-site non-RCRA Subtitle C surface impoundments.

The production index for this sector fell by 16% from 2001 to 2009, including a 13% decrease from 2008 to 2009 as shown in Figure 29. On the other hand, total production-related waste managed rose 1% for metal mining from 2008 to 2009.



**Figure 29. Percent Change in Production-Related Waste Managed and Production Index, 2001-2009: Metal Mining**

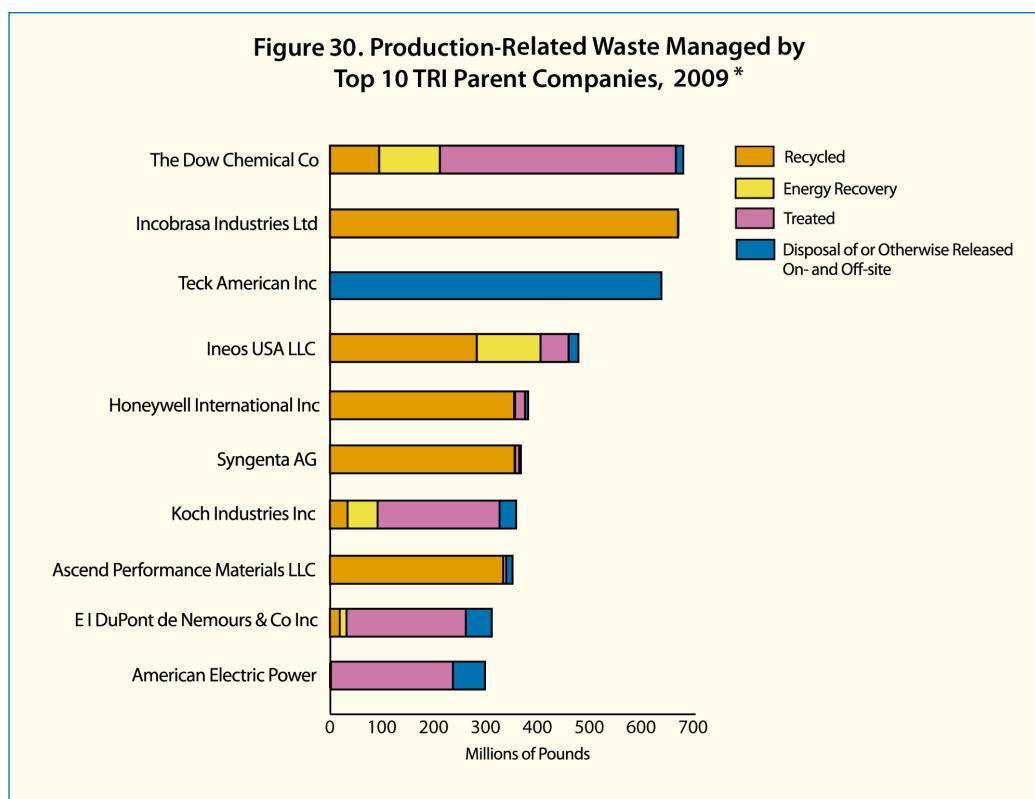


To learn more about this sector and how it can reduce chemicals generated and improve management practices, visit EPA's Minerals/Mining/Processing Compliance Assistant website at [www.epa.gov/compliance/assistance/sectors/mineralsmining.html](http://www.epa.gov/compliance/assistance/sectors/mineralsmining.html).

# Parent Companies

Many of the facilities reporting to TRI are owned by companies that also own other facilities reporting to TRI. Facilities reporting to TRI are asked to provide information on their parent company if they have one. The TRI parent companies must be located in the United States and must directly own at least 50 percent of the voting stock of the reporting facility's company.

The parent companies and single facilities with no parent company that reported the largest total quantity of chemicals in TRI production-related waste managed are shown in Figure 30. As stated earlier in this document, production-related waste includes the total amounts of toxic chemicals in waste managed by facilities, which helps track industry progress in reducing waste generation and in moving toward safer waste management alternatives. It includes quantities of chemicals recycled, treated, used for energy recovery, and disposed of or otherwise released on- and off-site.



\* For Reporting Year 2009, EPA placed an added emphasis on the importance of improved data quality for parent company names. These rankings reflect the parent company information provided by facilities in Reporting Year 2009 and have not been independently verified. There was one facility, Incobrasa Industries Ltd, with a comparable quantity of production-related waste managed that does not have a parent company; it is also included.

These companies vary in size and sector. The number of TRI reporting facilities owned by these companies ranges from 1 to 93. Five of the top ten companies operate primarily in the chemical manufacturing sector (Dow Chemical, Ineos USA, Syngenta AG, Ascend Performance Materials and DuPont). The others are in the food products sector (Incobrasa Industries), metal mining (Teck American) and electric power generation (American Electric Power). Koch Industries' TRI facilities operate in a variety of industry sectors including pulp and paper, petroleum refining, chemicals, and polymers and fibers. Honeywell International operates TRI facilities involved in manufacturing chemicals, plastics/rubber, primary and fabricated metals, machinery, and computers/electronics.

The Pollution Prevention Act of 1990 established a hierarchy to guide and encourage waste generators toward the best options for managing their wastes. At the top of the hierarchy is the most preferable option: the prevention of toxic waste generation through pollution prevention or source reduction activities. Pollution prevention practices can include modifications to equipment, processes, and procedures, as well as reformulation or redesign of products, substitution of raw materials, and improvement in maintenance and inventory controls. The next best options in the hierarchy are recycling the waste or recovering any energy stored in the waste. Next is treating or destroying the waste so that there is no potential for it to enter the environment. Finally, only as a last resort would facilities dispose of or release the waste into the environment.

Facilities are asked to report on the pollution prevention activities they carried out each year. Those facilities reporting pollution prevention activities may be making greater efforts and progress in reducing their toxic chemical wastes.

In 2009, about 10% of all facilities reporting to TRI indicated that they initiated pollution prevention activities. Over 20% of all facilities reporting to TRI indicated that they initiated pollution prevention activities in at least one year since 2005. Table 1 shows the percent of facilities of the top 10 parent companies that have reported source reduction. Based on current guidance, companies may only be reporting pollution prevention activities that were newly initiated in 2009. This may lead to an underestimation of total pollution prevention activities carried out by these companies. Thus, all pollution prevention activities reported in the recent past (2005 to 2009) are also presented as an estimate of total pollution prevention activity.

Some companies report additional information to EPA about their pollution prevention or waste management activities. This information can be accessed on each facility's individual Form R (Section 8.11) through TRI Explorer or Envirofacts ([www.epa.gov/tri/tritools/index.htm](http://www.epa.gov/tri/tritools/index.htm)).

**Table 1. Source Reduction Activities at the Top 10 Parent Companies for Production-Related Waste Managed, 2009**

Parent Company	Facilities Reporting for 2009	Percent of Facilities Reporting Source Reduction Activities for 2009	Percent of Facilities Reporting Source Reduction Activities at Least One Year 2005-2009
The Dow Chemical Co	48	15 %	31 %
Incobrasa Industries Ltd	1	0 %	0 %
Teck American Inc	3	0 %	33 %
Ineos USA LLC	16	13 %	19 %
Honeywell International Inc	67	15 %	30 %
Syngenta AG	4	25 %	50 %
Koch Industries Inc	93	1 %	9 %
Ascend Performance Materials LLC	3	0 %	0 %
E I DuPont de Nemours & Co Inc	60	28 %	40 %
American Electric Power	20	0 %	0 %

# TRI Tools and Resources

## Tools and resources that can help you find information specific to your concerns and communities:

For more information about the Toxics Release Inventory Program

- EPA's TRI website — [www.epa.gov/tri/triprogram/whatis.htm](http://www.epa.gov/tri/triprogram/whatis.htm)

For geography-specific analysis of TRI data

- State Data Sheets — [www.epa.gov/triexplorer/statefactsheet.htm](http://www.epa.gov/triexplorer/statefactsheet.htm)
- Urban Communities — [www.epa.gov/tri/tridata/tri09/nationalanalysis/tri-urban-comm-intro.html](http://www.epa.gov/tri/tridata/tri09/nationalanalysis/tri-urban-comm-intro.html)
- Large Aquatic Ecosystems — [www.epa.gov/tri/tridata/tri09/nationalanalysis/tri-lae-intro.html](http://www.epa.gov/tri/tridata/tri09/nationalanalysis/tri-lae-intro.html)
- Indian Country and Alaska Native Villages — [www.epa.gov/tri/tridata/tri09/nationalanalysis/tri-indian-country-alaska.html](http://www.epa.gov/tri/tridata/tri09/nationalanalysis/tri-indian-country-alaska.html)

To access the following analysis tools — [www.epa.gov/tri/tritools/index.htm](http://www.epa.gov/tri/tritools/index.htm)

- TRI Explorer is an on-line tool that generates TRI reports based on facilities, chemicals, geographic areas, or industry type at the county, state, and national level.
- Envirofacts provides access to information contained in TRI and other EPA databases, including Air, Chemicals, Facility Information, Hazardous Waste, Risk Management Plans, and Superfund.
- TRI.NET is a downloadable high performance data engine supporting large and complex TRI queries and trends.
- myRTK is a Web application designed for mobile devices that maps nearby facilities that report to TRI, as well as large environmental permit holders.
- TRI-CHIP is a database system containing technical and hazard information for the TRI chemicals.
- TRI Comparative Analysis Tool provides comparisons of TRI data with facility-level data from other EPA databases.

See also

- Chemical Right 2 Know ([www.chemicalright2know.org/](http://www.chemicalright2know.org/)) — a site developed by the Environmental Council of the States through a cooperative agreement with EPA





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