

Toxic Air Pollutants

What are Toxic Air Pollutants?

Toxic air pollutants (or air toxics) are those pollutants that are known or suspected to cause cancer or other serious health effects, such as reproductive effects or birth defects, or adverse environmental effects. They take the form of liquids, solids and gases. Toxic Air Pollutants include 187 pollutants designated by the U.S. Environmental Protection Agency (EPA) as Hazardous Air Pollutants (HAP) along with an additional 69 pollutants identified in South Carolina State Regulations as Toxic Air Pollutants. Examples of Toxic Air Pollutants are benzene, dioxin, formaldehyde, and mercury.

Scientists estimate that millions of tons of toxic pollutants are released into the air each year. Most Toxic Air Pollutants originate from manmade sources, including both mobile sources (e.g., cars, buses, trucks) and stationary sources (e.g., factories, refineries, power plants). However, some are released in major amounts from natural sources such as forest fires.

Efforts to Reduce Toxic Air Pollutants

Maximum Achievable Control Technology (MACT) Standards

Although Toxic Air Pollutants are emitted from many sources, the vast majority of the regulatory requirements for these substances focus on industrial and commercial sources. As required by the Clean Air Act, the EPA identified a federal list of Hazardous Air Pollutants (HAP) to be regulated, identified the industrial and commercial sector categories that emit these pollutants, and developed standards to control emissions from these sector categories. These standards, called Maximum Achievable Control Technology (MACT) standards, are based on the best emission controls being achieved by industry. Over 100 standards have been developed by the EPA and over 50 of these standards apply to industrial and commercial sources operating in South Carolina.

The MACT standards apply to major sources of HAP. A major source of HAP would be any source that has the potential to emit greater than 10 tons per year of a single HAP or 25 tons per year of a combination of HAP. Examples of these sources are pulp and paper mills, chemical plants, surface coating operations, and wood products plants. The EPA has estimated that these rules reduce annual emissions of nearly 200 different air toxics by about 1.7 million tons. In addition to federal standards, South Carolina has a state air toxic regulation that limits the concentration of Toxic Air Pollutants at the facility's boundaries.

The EPA requirements to reduce HAP are not a one-time occurrence. After standards have been in effect for 8 years, the EPA is required by statute to reevaluate and determine if the standard protects public health adequately. If the standard is not protective, the EPA adopts more stringent standards after considering costs, energy, safety and other factors. Every 8 years, the EPA is required to review the standards and revise them as necessary taking into account new/updated pollutant reduction practices or technologies.

Area Sources

Smaller industrial sources emitting HAP are called Area Sources. The EPA identified a total of 70 area source categories and finalized the last of these rules in March 2011. South Carolina has implemented these new rules that apply to a large number of commercial and industrial sources, including many sources that are not required to have air permits.

Mercury

There have been several efforts to specifically reduce mercury emissions. Some of the HAP standards mentioned above require the reduction of mercury emissions from significant mercury sources. Examples of sources required to reduce mercury emissions are electric arc furnaces; commercial, industrial, and institutional boilers; power plants, and commercial and industrial solid waste incineration units. There are 245 large industrial boilers and process heaters located at 70 facilities in South Carolina. There are over 100 smaller boilers subject to the area source boiler standards. As of March 2014, boilers located at area sources are now required to better control their mercury emissions, along with other HAP emissions. Boilers located at major sources were required to control their mercury emissions by January 31, 2016. As of April 2015, utility boilers are required to better control their mercury emissions, along with other HAP emissions. There are 12 utility boilers located at 5 power plants required to control their mercury emissions, along with other HAP emissions.

In addition, efforts to identify ways to decrease the amount of mercury in South Carolina's environment continue to be a priority. The S.C. Mercury Assessment and Reduction Initiative, which began in 2008, focuses on the assessment and reduction of mercury emissions, continued and enhanced risk communication, and increased recycling of mercury-containing products. The S.C. Mercury Assessment and Reduction Initiative, published in 2010, discusses assessment, monitoring and reduction efforts and recommends actions to accomplish those and other related goals.

Mobile Sources

The reduction of emissions from diesel engines is an important component in the effort to improve air quality. South Carolina actively participates in the Southeast Diesel Collaborative (SEDC), which is a voluntary partnership between the EPA, States, and other public and private entities and is intended to promote opportunities to reduce diesel emissions. Although diesel engines comprise a smaller percentage of all engines than gasoline engines, they contribute a significant portion of the Nitrogen Oxide (NO_x) and Particulate Matter (PM) pollution. The Bureau of Air Quality has been administering the EPA's Diesel Emissions Reduction Act (DERA) grant programs since 2008, repowering, retrofitting, and replacing diesel engines all over the State. Projects include the replacement of old school buses with newer buses; replacement of drayage trucks at the Charleston ports; repowering tugs that service the Charleston ports; replacement of farm tractors and long haul trucks; replacement of a diesel agriculture conveyor with an electric conveyor; truck stop electrification projects; and the installation of particulate filters and oxidation catalyst controls on a variety of equipment.

The Bureau of Air Quality also works with the South Carolina Department of Education to submit applications for the DERA School Bus Rebate Program, whereby a percentage of the replacement cost of eligible school buses is refunded to the State.

In addition to participation in the DERA Grant Program, the Bureau of Air Quality administers the Breathe Better (B²) Anti-Idling Program, which works to increase awareness of and reduce mobile source emissions from idling school buses and passenger vehicles in the car pickup line at schools.

Co-Benefit Reductions

Rules requiring the reduction of Toxic Air Pollutants have the added benefit of reducing Criteria Pollutants, such as ozone and particulate matter as well. This occurs because some Toxic Air Pollutants are also ozone causing volatile organic compounds (e.g., toluene) or particulate matter (e.g., chrome). Rules intended to reduce criteria pollutants also have the co-benefits of reducing toxic air pollutants.

Tracking Toxic Air Pollutants

Unlike Criteria Pollutants, there are no national ambient air concentration standards for Toxic Air Pollutants, making it difficult to assess the overall ambient impact in South Carolina. The State tracks actual Toxic Air Pollutant emissions from industrial sources. These emissions are reported as part of the state's Emissions Inventory reporting every 3 years. Certain industrial sources must also report annually their emissions of listed Toxic Air Pollutants as a part of the national Toxics Release Inventory.