

Sierra Club Iowa Chapter Policy to Reduce Particulate Matter (PM₁₀ and PM_{2.5}) Air Pollution in Iowa

What is particulate matter?

Particulate matter consists of small particles of dust, soot, liquid droplets and wood smoke particles that have become suspended in the air. These particles are smaller than the diameter of a human hair.

Particulate matter that is less than 2.5 micrometers in diameter is called fine particulate matter while particulates that are between 2.5 and 10 micrometers are called coarse particulate matter.

Some particulate matter can be seen as dust, haze or smog. Other particulate matter can be seen only with microscopes.

What are the health consequences?

Because particulate matter is so small, it can easily be drawn into the lungs and transported into the bloodstream, leading to health consequences. Particulate matter can also irritate your eyes, nose and throat. People with heart disease, asthma or other lung disease are at increased risk from particulate matter exposure. Exercising will increase the risk from particulate matter since air is drawn more deeply into the lungs and breathing is faster.

How is particulate matter formed?

Typically, particulate matter is made of black carbon (also called elemental carbon), organic carbon, metals and inorganic salts (sulfate, nitrate, ammonium, sodium, chloride).

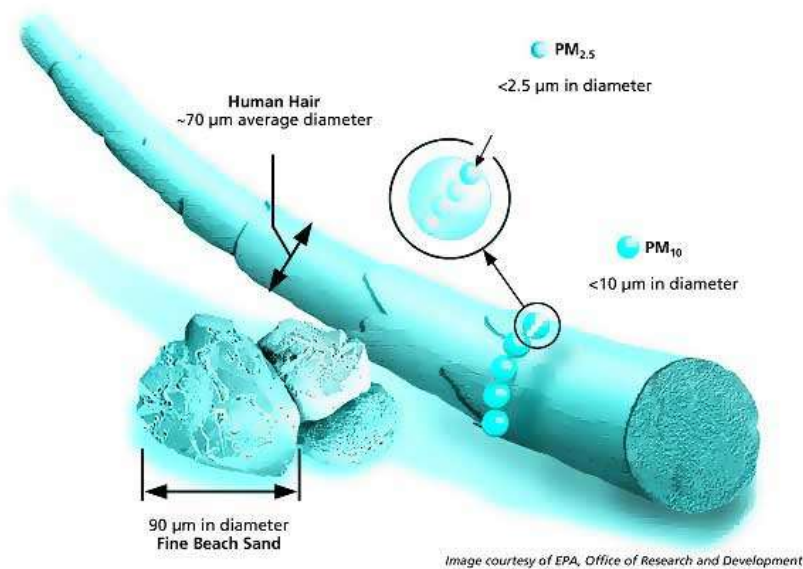


Image courtesy of EPA, Office of Research and Development

Particulate matter is created during crushing of rock and grinding operations. It can also be formed when vehicles travel on roads, by farm machinery stirring up soil and dust particles while working in fields, from particles of rubber from tires and particles of metals from brakes.

Burning wood, yard waste and garbage creates particulate matter. Particulate matter is also created by combustion of fuels, such as gasoline and diesel. It is created in some industrial processes and it is created by coal and gas power plants.

Ammonia gas emissions from fertilizer, manure and wastewater also create particulate matter.

Some particulate matter is formed in the atmosphere when two or more pollutants react.



Smoke from an outdoor wood boiler, photo credit Harold Hensel

Status of Iowa's Air Quality

Under the federal Clean Air Act, the federal Environmental Protection Agency has set levels for particulate matter to protect human health. The Iowa Department of Natural Resources is responsible for developing industry permits so that appropriate levels of particulate are maintained, to monitor the air quality across the state and to enforce compliance with permits. However, concentrated animal feeding operations (CAFOs), which are large, industrial-scale animal factories, are currently exempt from the federal regulations.

Several regions of the state have high background levels of particulate matter. These include Johnson County, Dubuque County, Scott County and Muscatine County.

When an area exceeds thresholds for particulate matter, the area is considered to be out of attainment. At that point, the Iowa Department of Natural Resources is required to write more stringent requirements

for air permits for new industries and major upgrades to existing industry. Although this does not halt economic development in an area, it does mean that more expensive emissions control devices must be installed. Additionally, the industry must install off-setting controls on other portions of the industry or on another emission source in the region. Furthermore the DNR, with Environmental Protection Agency, must implement plans to reduce the emissions including requiring existing industries to install emission reduction equipment or requiring production to be reduced.

In 2008, Scott County was not meeting the standards for fine particulate matter and was declared as a non-attainment area. Through efforts to control the PM2.5 emissions, the region finally achieved attainment by 2009.

Policy recommendations

The Iowa Chapter of the Sierra Club supports policies that

- Prohibit burning of trash, yard waste, leaves;
- Prohibit outdoor wood boilers;
- Reduce excess idling of diesel engines;
- Limit the amount of ammonia emissions from a CAFO so as not to exceed 500 ppb for a one-hour time-weighted average (TWA), measured at the property line, that concentration at a residence or public use area should not exceed 150 ppb for a one-hour TWA, and that each CAFO be allowed up to seven days each calendar year when they are allowed to exceed the concentration for ammonia. These recommendations are based on the "Iowa Concentrated Animal Feeding Operations Air Quality Study Final Report," written by Iowa State University and the University of Iowa Study Group in February 2002. These regulations should be enforceable.
- Support complete streets, including bike paths and sidewalks, which would reduce use of vehicles;
- Support the use of public transportation, such as buses and rail, that utilize transportation fuels more efficiently.

What can I personally do to reduce the creation of particulate matter?

- Keep personal vehicles tuned and the tires inflated;
- Reduce the number of miles traveled in a vehicle;
- Drive a vehicle with greater miles per gallon;
- Do not idle your car;
- Keep your vehicle functioning properly;
- Walk, bike, carpool or use mass transit;
- Test soil before applying fertilizer so that appropriate amounts are used as needed;

- Compost yard waste;
- Do not burn garbage and yard waste;
- Replace your gasoline-powered lawn mower with a reel mower or an electric-powered mower;
- Replace the furnace in your home with a more energy efficient model;
- If burning wood in a fireplace or fire pit, only burn seasoned wood; never burn green wood.

Sources

“Controlling Fine Particulate Matter Under the Clean Air Act: A Menu of Options,” State and Territorial Air Pollution Program Administrators and Association of Local Air Pollution Control Officials, March 2006

<http://www.airnow.gov>

“Implementing the PM2.5 Ambient Air Quality Standard in the State of Iowa,” Iowa Department of Natural Resources, December 30, 2010

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Iowa Dept of Natural resources web site, <http://www.iowadnr.gov/air/index.html>

<http://www.iowadnr.gov/Environment/AirQuality/CommonAirPollutants/FineParticles.aspx>

“Up in the Air,” Andy Piper, *Dubuque Telegraph Herald*, October 17, 2010

The Federal Register, “Finding of Substantial Inadequacy of Implementation Plan; Call for Iowa State Implementation Plan Revision,” A Rule by the Environmental Protection Agency, July 14, 2011