



OZONE 101

What is Ozone?

Ozone is not emitted directly into the air. It is a gas that forms when nitrogen oxides (NO_x) and volatile organic compounds (VOCs) combine in the atmosphere on bright sunny days with warm temperatures. NO_x and VOCs are referred to as ozone precursors.

NO_x is produced almost entirely as a by-product from high-temperature combustion, and VOCs are organic (carbon-based) chemicals that easily turn into vaporous gas, meaning use of fossil fuels are a major source of ozone precursors.

Ground-level ozone, or the “bad” ozone, should not be confused with the earth’s protective ozone layer, the “good” ozone.

Ozone has the same chemical structure whether it occurs on the ground or high above the earth, but ozone becomes a danger to human health when it forms at lower levels where humans breathe it.

What are the sources for NO_x and VOCs?

For regulatory purposes, emissions sources are divided into five categories.

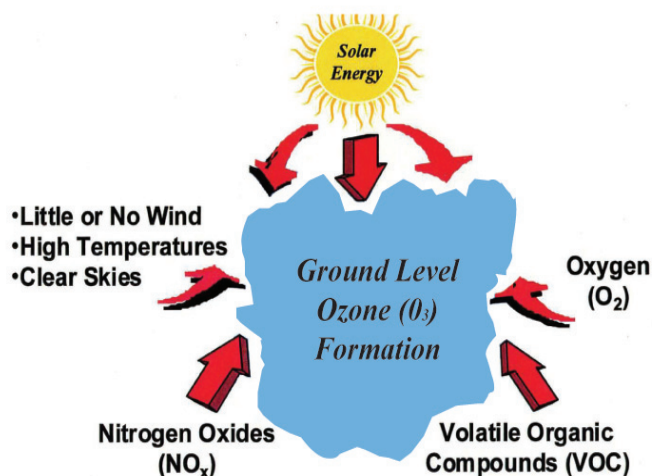
Stationary sources, or point sources, consist of: petrochemical oil refineries, chemical manufacturing facilities, power plants, breweries, and bakeries. These facilities are required to annually report the quantity and type of emissions.

Area sources include: gasoline service stations, print shops, dry cleaners, restaurants, paint and body shops, and outdoor burning. These facilities are not required to submit annual emissions reports.

On-road mobile sources are: automobiles, trucks, motorcycles.

Off-road and non-road sources include: marine vessels, trains, airplanes, and construction equipment.

Biogenic sources are emissions from plants and trees.



How does “bad” ozone affect human health?

Exposure to ozone pollution can lead to serious health problems. People who have chronic illnesses such as asthma, chronic bronchitis and emphysema are at greater risk of experiencing respiratory symptoms.

Even at low levels ozone pollution can trigger problems for healthy people including chest pains, coughing, nausea, throat irritation and congestion.

Because ozone pollution usually forms in hot weather, people who spend a significant amount of time outdoors during the summer may be affected such as children, the elderly, outdoor workers and people exercising.

Did you know....

Ozone pollution can lead to complications with cardiovascular disease and even death.

Researchers recently discovered that a 10 degree increase in temperature on the same day with the lowest ozone levels increased deaths from heart attack or stroke by 1 percent. However, there was an 8 percent increase on days with the highest ozone levels.

What does the government say about ozone?

By studying the effects of air pollution on humans and the environment, the U.S. Environmental Protection Agency (EPA) established federal health standards for 6 pollutants. Ground-level ozone is one of these pollutants.

An area that fails to meet the federal health standard for a pollutant is considered by the EPA to be in nonattainment for that pollutant. The Houston-Galveston-Brazoria (HGB) area is considered to be in nonattainment for ozone. The 8 counties that make up the HGB area are: Brazoria, Chambers, Fort Bend, Galveston, Harris, Liberty, Montgomery and Waller.

The 1990 Clean Air Act requires the EPA, states, and cities to implement programs to further reduce emissions of ozone precursors (NOx and VOCs).

The air quality in the HGB area has improved. Cleaner fuels and cars are being developed. Power plants, oil refineries and petrochemical plants have reduced their emissions due to regulatory oversight by the EPA and the Texas Commission on Environmental Quality (TCEQ). However, this region is still considered to be in non-attainment for ozone.

The struggle for ozone-free air has been going on for more than 30 years in Texas in the Houston area.

What can I do?

- Mow your yard in the late afternoon.
- Be sure to limit outside activities on high ozone days, especially if you are one of those at high risk for experiencing respiratory difficulties.
- Carpool, ride mass transit or walk/bicycle to reduce car emissions, especially on hot summer days.
- Make sure your car tires are properly inflated and your wheels are aligned. Keep your automobile well tuned and maintained.
- Support clean air legislation by contacting your local state representative or congressman.
- Participate in utility company's that practice conservation.

What is the Air Quality Index (AQI)?

The AQI is used to report daily air quality. The color coded chart indicates the level of pollution and the health effects associated with that level.

The EPA calculates ground-level ozone measurements based on the national health standards for this pollutant and breaks it down from 0 to 500. The higher the value, the greater the risk is for public health.

When the AQI is measured above 100, air quality is considered first to be unhealthy for sensitive groups who suffer from existing respiratory illness like asthma, emphysema and bronchitis and then unhealthy for everyone at 151 and above.

0 to 50	Good	Green
51 to 100	Moderate	Yellow
101 to 150	Unhealthy for Sensitive Groups	Orange
151 to 200	Unhealthy	Red
201 to 300	Very Unhealthy	Purple
301 to 500	Hazardous	Maroon

How can I get updated ozone alerts?

You can receive e-mail alerts by going to Harris County's Office of Emergency Management Web page:

http://ozone.hcoem.org/ozone_subscribe.php

You can also visit the TCEQ's Web site for more information: <http://www.tceq.state.tx.us/>.

Air.gov

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