Facts About Ozone

April 2008

Ozone (O_3) is a highly reactive gas that is a form of oxygen. Ozone forms in the atmosphere, primarily from the action of sunlight on two products of fuel combustion—hydrocarbon vapors and nitrogen oxides.[1]

- Ozone reacts chemically ("oxidizes") with internal body tissues causing inflammation, like a "sunburn," of the lung. Ozone acts as a powerful respiratory irritant at the levels frequently found across the nation during the summer months. Breathing ozone may lead to serious health consequences, including:

    - premature death;[2]
    - shortness of breath[3] and chest pain; [4]
    - wheezing and coughing;[5]
    - inflammation of the lining of the lungs;[6]
    - increased susceptibility to respiratory infections;[7]
    - increased risk of asthma attacks; and
    - increased need for medical treatment and hospitalization for people with lung diseases, such as asthma or chronic obstructive pulmonary disease (COPD) [8]

- Children who regularly must breathe high levels of ozone may face reduced lung function in adulthood.[9] Reduced lung function increases the risk of lung disease later in life.

- The U.S. Environmental Protection Agency (EPA) estimates one out of every three people in the United States is at a higher risk of experiencing problems from ground-level ozone.[10] Five groups of people are at particular risk:

    - people with lung diseases such as asthma, chronic bronchitis and emphysema;[11]
    - children -- because their airways are smaller, their respiratory defenses are not fully formed, and their higher breathing rates increase their exposure;[12]
    - people who work or exercise outdoors;[13]
    - senior citizens;[14] and
    - "responders"-- otherwise healthy individuals who experience health effects at lower levels of exposure than the average person.[15]

- Ozone levels typically rise between May and October when higher temperatures, increased sunlight, and stagnant atmospheric conditions transform air pollutants into ozone.

- Ozone is such a risk to human health that the EPA is required to establish official limits, called national ambient air quality standards, on the level of ozone that can be in the nation's air. The Clean Air Act requires that EPA set the standard at a level that protects public health with an adequate margin of safety. The Act also requires that states must clean up the ozone in their communities to meet that standard .In March 2008, the EPA set a more protective ozone standard of 0.075 ppm averaged over an eight-hour period. [16]

- To reduce ozone air pollution, the American Lung Association supports stringent control*s* to reduce the emissions of hydrocarbon compounds and nitrogen oxide that help create ozone. These measures include:

    - stricter pollution control requirements for power plants and industrial boilers, including requirements for older plants to meet current emissions standards;
    - stronger pollution control requirements for new motor vehicles and small engines, including lawn and garden equipment;

- retrofitting of existing diesel engines including trucks, buses and heavy equipment, to make them cleaner; and
- greater use of lower emitting chemicals, including paints and finishes.

- The ground-level ozone in the lower atmosphere (troposphere) should not be confused with the natural protective layer of ozone in the upper atmosphere (stratosphere). Although both are made of the same chemical, the ozone in the upper atmosphere protects us from the sun's harmful ultraviolet rays, while the ozone in the lower atmosphere harms us.
- Ozone is a powerful greenhouse gas. Reducing ozone can help reduce global warming and climate change.[17]

For more information, call the American Lung Association at 1-800-LUNG-USA (1-800-586-4872), or visit our web site at http://www.lungusa.org.

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[1] U.S. Environmental Protection Agency. *Air Quality Criteria for Ozone and Related Photochemical Oxidants*, 2006.

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[10] http://www.epa.gov/airnow/aqibroch/aqi.html#11

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[16] U.S. Environmental Protection Agency. National Ambient Air Quality Standards for Ozone. Final Rule, *Federal Register*, Vol. 73, No. 60, March 28, 2008.. The EPA evaluates data from ozone air pollution monitors to see whether a community meets that standard based on the fourth highest reading per year averaged over three years.

[17] U.S. Environmental Protection Agency. *Air Quality Criteria for Ozone and Related Photochemical Oxidants*, 2006.