Air quality cards

Sulphur dioxide

Produced when a material or fuel containing sulphur is burned. In the UK, the main source of sulphur dioxide is from power stations burning fossil fuels e.g. coal and heavy oils. Globally much atmospheric sulphur dioxide is from natural sources. Widespread domestic use of coal can lead to locally high concentrations of sulphur dioxide.

Health effects

Moderate concentrations can affect lung function in asthmatics. At high levels, victims report tightness of the chest and coughing. Asthmatics may require medical assistance.

More harmful when other pollution concentrations are high.

Nitrogen oxides

Nitric oxide (NO) is produced mainly from road transport emissions and combustion processes such as power stations. In the atmosphere NO reacts with oxygen to produce nitrogen dioxide (NO2). NO2 and NO are termed NOx emissions.

Health effects

NO is not harmful to health.
Nitrogen dioxide can irritate the lungs and make victims more likely to infections such as the flu, as resistance to disease is lowered. Continued or frequent exposure to concentrations higher than normal can increase the numbers of children with respiratory illness.

Air quality cards

Fine particles

Composed of a wide range of materials from various sources: combustion (mainly road traffic); secondary particles (sulphates and nitrates formed by chemical reactions which can be transported far across Europe); coarse particles (e.g. soils and dusts from the Sahara desert, sea salt, biological particles, dust from building work).

Health effects

Monitoring of largest particles for health effects is most common. Smaller, finer particles can be carried into lungs and cause inflammation. People who have heart and lung disease are most at risk of worsening conditions. Particles may carry cancer-causing compounds into the lungs.

Ozone and volatile organic compounds

Ozone does not come from man-made sources in any significant quantities. It is formed in the lower atmosphere by chemical reactions started by sunlight. Volatile organic compounds (VOCs) can react with oxygen in the presence of sunlight and NOx. Solvent use, petrol handling and distribution, road transport emissions and power stations all add to VOCs.

Health effects

Ozone irritates the airways of the lungs, worsening symptoms of asthmatics and victims of lung disease.

Maximum concentrations of ozone generally occur downwind of the source. Ozone can take hours or days to be produced from chemical reactions.

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Toxic organic micro-pollutants (TOMPS)

Produced by the incomplete combustion of fuels.
Even though these are generally emitted in very small quantities they are highly toxic or carcinogenic.
Compounds include PAHs (polyaromatic hydrocarbons), PCBs (polychlorinated biphenyls), dioxins and furans.

Health effects

TOMPS cause a wide range of effects, from cancer to increased likelihood of nervous system disorders, and can interfere with child development.

Even the tiniest amount can cause damage.

Benzene

Benzene is a VOC found in petrol. In Europe, the main source of benzene in the atmosphere is by the distribution and combustion of petrol. Combustion by petrol vehicles accounts for 70% of total emissions.

Health effects

Possible effects include cancer, central nervous system disorders, liver and kidney damage, reproductive disorders and birth defects.

Air quality cards

1,3-butadiene

A VOC emitted into the atmosphere by fuel combustion from petrol and diesel vehicles. It is an important chemical in some industrial process e.g. the manufacture of synthetic rubber.

Health effects

Possible effects include cancer, central nervous system disorders, liver and kidney damage, reproductive disorders and birth defects.

Carbon monoxide

Colourless, odourless gas produced by the incomplete combustion of fuel. It is mainly produced by road transport, in particular petrol vehicles.

Health effects

The gas prevents the normal transport of oxygen in the blood. This can lead to a reduction in oxygen supply to the heart (particularly those with heart disease) and brain. At moderate concentrations it can cause drowsiness, headaches, sickness and flu like symptoms. Prolonged and high exposure can be fatal.

Air quality cards

Lead

The majority of lead emissions come from vehicles burning leaded petrol. Heavy industry can increase the emission concentration.

Health effects

Even small amounts of lead can be harmful, especially to infants and young children. Lead absorbed by a mother can affect an unborn child. Exposure has been linked to decreased mental function, poor memory and concentration span, poor visual and movement performance and brain damage in children.