

ENVIRONMENTAL PROTECTION : AIR POLLUTION

When you burn fossil fuel, you're combining the carbon it contains with oxygen in the air to release heat. However, the process also creates byproducts that are potentially dangerous. In addition, the usual fuels used in transportation, such as gasoline or diesel, aren't a single substance, but a chemical soup of ingredients such as butane, propane, xylene and benzene.

Carbon based petrochemical products are broken up in combustion to form, among many other products, carbon dioxide, carbon monoxide, volatile organic compounds, nitrogen oxides, sulphur oxides and very fine particulates. In addition, unburned hydrocarbons, some of which evaporate directly from the gas tanks of cars and trucks, escape before and after combustion and join other VOCs in the air.

When sufficient concentration of sulphur and nitrogen oxides and hydrocarbons builds up in the atmosphere and is bombarded by sunlight, a complex series of chemicals, including nitrogen dioxide and ozone. Also, very fine acidic particles are formed, such as sulphates and nitrates. These fine particulates are so small they are drawn deep into our lungs, causing stress to our cardiopulmonary system.

To understand these byproducts, it is useful to consider how they're used in more concentrated form by industry. Nitrogen dioxide is a poisonous brown gas used as a catalyst and oxidizing agent. Nitric acid is a transparent, fuming corrosive liquid that is a highly reactive oxidizing agent used in the production of fertilizers, explosives and rocket fuels. Ozone is an unstable oxidizing agent, poisonous in high concentrations, with a pungent, irritating odour. In weak concentrations, ozone is used as a bleach and to sterilize water.

In effect, breathing air containing these chemicals is like breathing diluted quantities of poison gas, acid and bleach.

What is its effects?

Human can be adversely affected both before and after the burning of fossil fuels. Before burning, fumes from evaporating petroleum fuels can be poisonous and carcinogenic in high concentrations. In addition a third group of toxic chemical by-products is subsequently formed from reactions of combustion products in the atmosphere.

FINE PARTICULATES

Fine particulates are particles so small they remain suspended in air where they can be inhaled and deposited deep in the respiratory system. Primary fine particulates are released directly into the air from sources such as tailpipes.

Secondary fine particulates are formed from physical and chemical reactions involving gases such as NOx, SOx, and VOCs, emitted into the air.

Fine particulates are associated with respiratory symptoms, increased emergency room visits for asthma, increased hospitalization, impaired lung function, increased absence from work and increased death from cardiopulmonary disease and lung cancer. Children, the elderly, smokers, asthmatics and others suffering from respiratory disorders are especially vulnerable to this type of air pollution.

Current research indicates that fine particulate matter is the air pollutant with the greatest immediate health impacts- and resulting costs.

As well as causing health damage, fine particulates can lead to major reductions in visibility. Although it is difficult to put a dollar figure on the loss of visibility, it is clear British Columbians value the beauty of the environment. Recent scientific research indicates that vehicle emissions and wood smoke are the greatest causes of reduced visibility in B.C.