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ENVIRONMENT

Air Pollution 101©

by Valentine Rinner

We measure air pollution in terms of the concentration of a set of identified substances in the air. The main ones are gases such as carbon, sulfur and nitrogen oxides but there are also particulate matter, metals and ozone.

Different types of activities – be they anthropogenic or natural - generate different types of air pollution, some worse than others. These days we are often above the recommended levels of air particulate matter, famously known as PM10 and PM2.5. The numbers denote the size of those super small particles floating around in the air and entering our lungs.

PM10 particulates have a diameter between 10 and 2.5 micrometers. This is about 5 times smaller than the diameter of a human hair. They include pollens, all types of dust, molds, sand, etc. PM2.5 particulates have a diameter smaller than 2.5 micrometers. You need a special type of microscope to be able to see one of these. They are mainly produced by different types of combustion such as domestic wood burning and forest fires, an also motor vehicles and power plants.

Outdoors air pollution is a serious societal problem. We are now recognizing that it is a high-risk factor in respiratory and cardiovascular diseases, and lung cancer. Each year a global estimate of nearly 4 million people die prematurely due to outdoor air pollution.

Air pollution has adverse effects not only on our human health but also on the environment around us, for example affecting crop yields and water quality resulting in big economic losses and more health hazards for all of us.

There are many sources of pollutants but the ones that we are most exposed to and that we should have the power to control as a society are industrial processes and transportation, especially road transport. Factories and industrial units continuously emit pollutants such as Carbon Monoxide (called C-O) or Sulphur Dioxide (called S-O-2) while transportation releases particulate matter of all sizes as well as CO2 and nitrogen oxide.

Today you can find air pollution monitoring stations installed more or less everywhere. The European Environmental Agency maintains a regional air quality database called Airbase. It contains data on over 3,000 cities in dozens of countries. Anyone can access

the historical data and you can even find it in real-time on "airqualitynow.eu". In Ile-de-France there is a local agency called AirParif that audits air pollution in the region and informs citizens when there is a high-pollution alert. For the rest of France you can look on "esmeralda-web.fr". With this data we can see that some areas are highly polluted by one particular source of pollution and not at all by other sources. The geographical location of pollution sources is a big factor in determining the level of air pollution.

However there is a second major factor which is how it travels. Indeed some pollutants stagnate in the air while others disperse quite easily. How molecules travel depends on their weight and composition as well as how they react to local atmospheric conditions such as humidity or temperature. So relocating factories outside city centers does not reduce pollution however it reduces direct human exposure to pollution, if the wind doesn't bring it right back into the city…

So what is it like where you live or work? Go and have a look on one of the websites I've mentioned to have an idea of the type of air pollution you should keep an eye on.

Bye everyone! Stay tuned for a future 10 minutes for the Planet episode on how to limit your exposure to outdoor pollution.