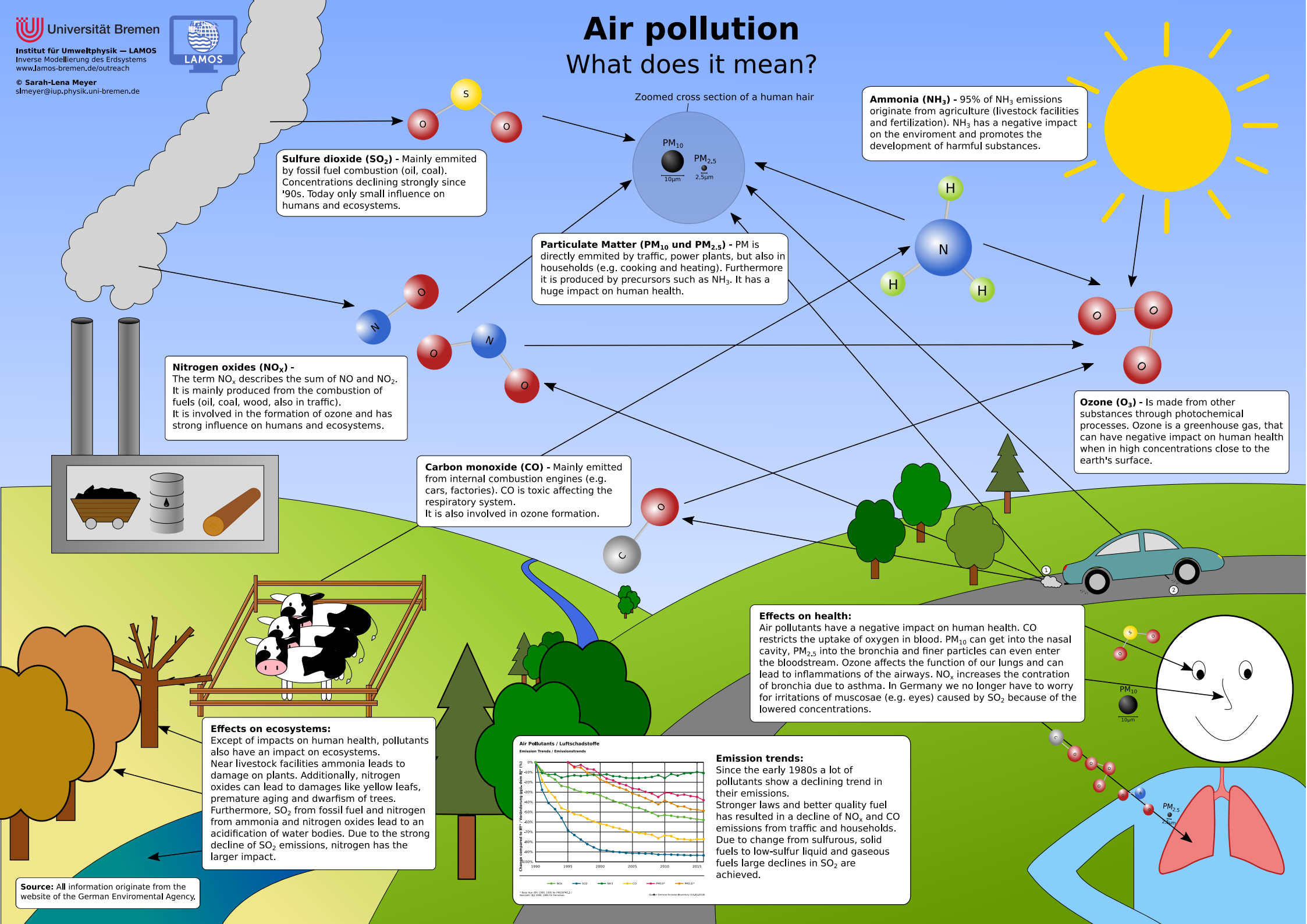




Air pollution

What does it mean?



Sulfure dioxide (SO_2) - Mainly emitted by fossil fuel combustion (oil, coal). Concentrations declining strongly since '90s. Today only small influence on humans and ecosystems.

Nitrogen oxides (NO_x) - The term NO_x describes the sum of NO and NO_2 . It is mainly produced from the combustion of fuels (oil, coal, wood, also in traffic). It is involved in the formation of ozone and has strong influence on humans and ecosystems.

Carbon monoxide (CO) - Mainly emitted from internal combustion engines (e.g. cars, factories). CO is toxic affecting the respiratory system. It is also involved in ozone formation.

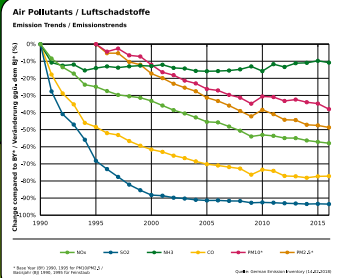
Particulate Matter (PM_{10} und $\text{PM}_{2.5}$) - PM is directly emitted by traffic, power plants, but also in households (e.g. cooking and heating). Furthermore it is produced by precursors such as NH_3 . It has a huge impact on human health.

Ammonia (NH_3) - 95% of NH_3 emissions originate from agriculture (livestock facilities and fertilization). NH_3 has a negative impact on the enviroment and promotes the development of harmful substances.

Ozone (O_3) - Is made from other substances through photochemical processes. Ozone is a greenhouse gas, that can have negative impact on human health when in high concentrations close to the earth's surface.

Effects on health:
Air pollutants have a negative impact on human health. CO restricts the uptake of oxygen in blood. PM_{10} can get into the nasal cavity, $\text{PM}_{2.5}$ into the bronchia and finer particles can even enter the bloodstream. Ozone affects the function of our lungs and can lead to inflammations of the airways. NO_x increases the contraction of bronchia due to asthma. In Germany we no longer have to worry for irritations of muscosae (e.g. eyes) caused by SO_2 because of the lowered concentrations.

Effects on ecosystems:
Except of impacts on human health, pollutants also have an impact on ecosystems. Near livestock facilities ammonia leads to damage on plants. Additionally, nitrogen oxides can lead to damages like yellow leafs, premature aging and dwarfism of trees. Furthermore, SO_2 from fossil fuel and nitrogen from ammonia and nitrogen oxides lead to an acidification of water bodies. Due to the strong decline of SO_2 emissions, nitrogen has the larger impact.



Emission trends:
Since the early 1980s a lot of pollutants show a declining trend in their emissions. Stronger laws and better quality fuel has resulted in a decline of NO_x and CO emissions from traffic and households. Due to change from sulfurous, solid fuels to low-sulfur liquid and gaseous fuels large declines in SO_2 are achieved.