



## Particles: Impact on health and climate

### Particles change the atmosphere

The light and energy of the sun have to pass a lot of barriers on their way through the atmosphere. It is not only the water droplets of the clouds, which blur sometimes the sun. Fine particles also (either liquid or solid) belong to these barriers in the air. We call them aerosols.

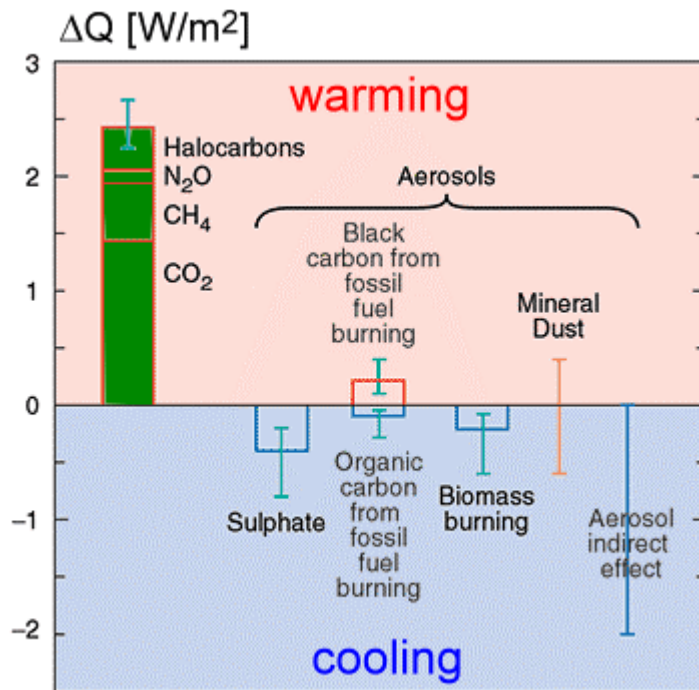
Dust and other particles have many natural origins: wind or plant emissions and in very drastic cases volcano eruptions. Large amounts of dust come from industries, car exhaust, power plants, from human induced fires or other changes in the landscape. The anthropogenic contribution to the particle load in the air is remarkable.



**1. The impact of particles on the properties of our atmosphere becomes very obvious to us if they reduce the visibility of the air like on this photo in the Smoky Mountains. (visibility above: about 100 miles, below: about 20 miles)  
© Oak Ridge National Laboratory**

### Particles burden our health and cool the Earth surface

Diseases caused by particles have been the day-to-day fate of many industrial workers although today conditions are better than in the past. However, very fine particles are still regarded as a big danger for health, causing the current debate about 'fine dust'. The problem of sulphuric acid particles and acid rain is basically solved in Europe now by filtering, but it is still a challenge in many developing countries. We could say: in order to prevent damage from our environment and our own health we strive to reduce the human made particle burden in the air as much as possible.



Particles also play a role in the energy budget of the Earth. Some of them, such as black soot, absorb light very well and warm the atmosphere. Others, like sulphuric acid particles, reflect the sunlight and cool the Earth's surface. We assume that the total impact of all particle effects adds up to a significant cooling of the climate system which counteracts the greenhouse effect.

2. Cut-out of the IPCC graph on factors forcing climate change. The impacts of greenhouse gases (left column in green) and changes caused by aerosol are compared. For some of the aerosol impacts we cannot give any value (column) but only an error bar due to the wide uncertainty range.  
 Original source: [IPCC TAR - Summary for Policymakers](#)

© ACCENT 2006 | [www.accent-network.org](http://www.accent-network.org)