

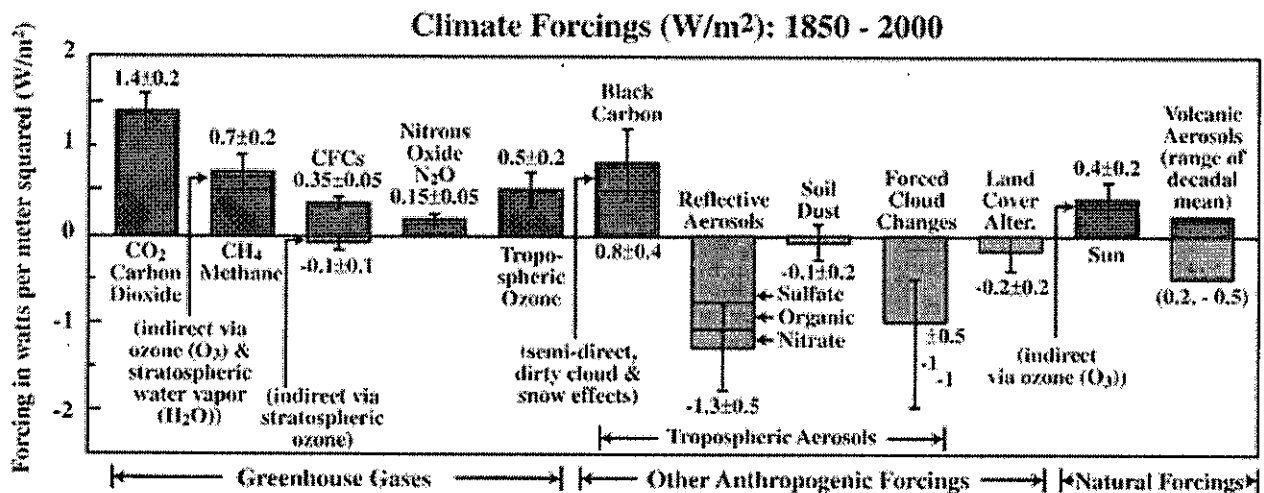
Black Soot

- Black carbon or soot is generated from
 - automobile traffic, primarily from diesel trucks and buses;
 - industrial processes with inefficient combustion;
 - outdoor forest fires and the burning of fields in the tropics; and
 - household burning of coal and biomass fuels.

- Emissions are large in areas where cooking and heating are done with wood, field residue, cow dung and coal, at a low temperature that does not allow for complete combustion.
 - **Nearly 80% of black soot emissions come from developing countries** (Streets et al., *Journal of Geophysical Research*, December 2004)

- The resulting soot particles
 - absorb sunlight directly, heating the atmosphere
 - indirectly affect climate through modifying cloud radiative properties (more black soot means smaller, more reflective clouds and cooling)
 - increase the albedo and heat absorption of snow and ice-covered surfaces

- **Black soot has been proposed as possibly the second most important greenhouse species** after CO₂ (see below), though that view has been challenged within the scientific community.
 - According to one computer simulation by NASA scientist Jim Hansen, black soot may be responsible for 25% of observed global warming over the past century.



Source: NASA Press Release, January 2002,

<http://www.gsfc.nasa.gov/gsfcearth/pictures/hansen010302/figure2m.gif>