The Effect of Transportation on Climate Change

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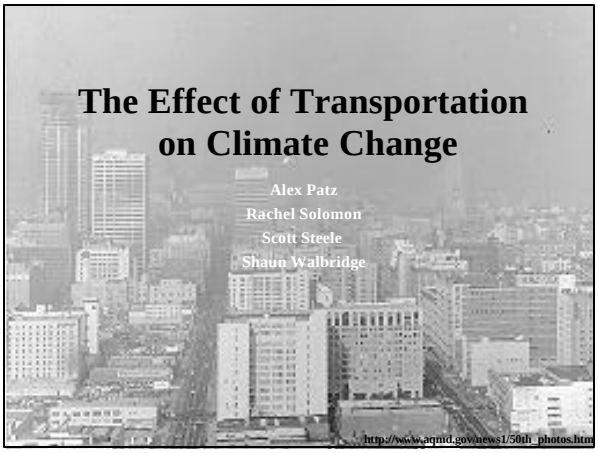


Exhaust Chemicals

- GHGs:
  - Carbon Dioxide (CO_2)
  - Methane (CH_4)
  - Nitrogen Oxides (NO_x)
  - Tropospheric Ozone
- Non GHGs:
  - Carbon Monoxide (CO)
  - Particulate Matter
  - Sulfur Dioxide (SO2)
  - Benzene

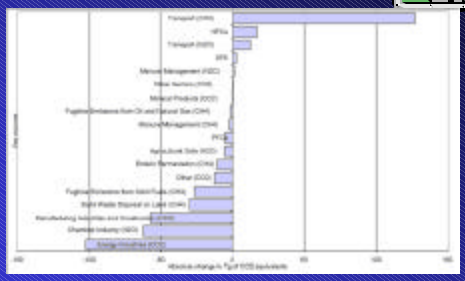
Impacts of Transportation

- Both developing and developed nations are effected by emissions caused by transport
- Problems include:
  - Millions of premature deaths from ground-level pollution
  - Respiratory illness
  - Behavioral problems

Description

- Transportation consumes ¼ of the world's energy
- 81% of GHG emissions are CO_2
- 14% of worldwide CO_2 emissions come from mobile sources
- Transportation accounts for 30% of CO_2 emissions in developed countries

90s GHG trend in EU



Rationale

- Increase in worldwide necessity for transportation leads to greater CO_2 emissions
- SUVs in the US cause to 3-4 times more pollution than from smaller cars
- Increase in vehicle miles traveled per person in the US
- Building of roads and parking lots decrease albedo

Current Status in Kyoto Protocol

- Issue of transportation not directly addressed in the Kyoto Protocol
- Proposes an emission reduction of GHGs (Article 2) not mentioned in the Montreal Protocol

Current Status in Kyoto Protocol (cont.)

- Omission may be due to:
  - -Long period of planning necessary to improve mass transit systems
  - -Socio-economic status associated with public transportation in the US
  - -Length of time necessary to market transportation using cleaner burning fuel
  - -Car manufacturing and production loss (economic factors- loss of jobs)

Current Status in Kyoto Protocol (cont.)

- Reasons necessary:
  - Point source vehicle emissions major contributor
  - Vehicles increasing in quantity, especially in developing nations
  - Health effects
  - Set positive systems in place for developing nations

Sources

- US EPA: Global Warming- Emissions http://yosemite.epa.gov/OAR/globalwarming.nsf/content/EmissionsIndividualOntheRoad.html?OpenDocument
- Atmospheric Sciences Data Center: Radiation Budget Lesson http://eosweb.larc.nasa.gov/EDDOCS/scierbe.html
- Albritton, Daniel et. al. " Summary for Policymakers." http://www.ipcc.ch/pub/spm22-01.pdf
- UN Energy and Environment, April 2003 http://www.uneptie.org/energy/env/index.htm
- Emissions of Greenhouse Gasses in US. March 2003. http://www.eia.doe.gov/oiaf/1605/ggrpt/tbles/2.html

Sources

- Pew Center: Anthropogenic CO2 sources. May 2003 http://www.pewclimate.org/global_warming_basics/facts_and_figures/anthroghg.cfm
- EPA: Global Warming: Transportation. http://yosemite.epa.gov/oar/globalwarming.nsf/webprintview/ActionsTransportation.html
- Sierra Club: SUVs Emit More Air Pollution Than Cars http://www.sierraclub.org/globalwarming/suvreport/pollution.asp
- Car Exhaust, Air Pollution. August, 2003 http://www.nutramed.com/environment/carschemicals.htm