United States Environmental Protection Agency

Office of Transportation and Air Quality

EPA420-F-05-003
February 2005

Emission Facts

Calculating Emissions of Greenhouse Gases: Key Facts and Figures

The U.S. Environmental Protection Agency (EPA) developed this series of four fact sheets to facilitate consistency of assumptions and practices in the calculation of emissions of greenhouse gases from transportation and mobile sources. They are intended as a reference for anyone estimating emissions benefits of mobile sources air pollution control programs.

Average Fuel Economy

EPA and the Federal Highway Administration (FHWA) use two different methodologies for calculating the average fuel economy of a passenger vehicle. Although MOBILE6 (EPA's computer model for estimating emissions for highway vehicles) estimates are more current, EPA uses the FHWA numbers in developing the greenhouse gas inventory because they are consistent with the methodology used to estimate carbon dioxide emissions.

Fuel Economy Estimates from MOBILE6

(in miles per gallon [mpg])

Passenger car	23.9 mpg
Light duty truck	17.4 mpg
Passenger vehicle (cars and light trucks combined)	20.3 mpg

Source: MOBILE6 model run conducted in 2003, based on fuel economy test data from EPA's annual Fuel Economy Trends Reports. Estimates are in-use fleet averages for 2003 vehicles and earlier. Estimates include all vehicles up to 25 years old. Note: These estimates do not include vehicles over 8500 pounds.

Fuel Economy Estimates from FHWA

Passenger car	22.1 mpg
Light duty truck	17.6 mpg

Source: FHWA "Highway Statistics, 2001." Estimates are in-use fleet estimates obtained by dividing fleet total Vehicles Miles Traveled (VMT) by fuel sales in each category.

Vehicle Miles Traveled Per Year

Typical passenger vehicle (cars and trucks combined) 12,000 miles

Source: Approximation from several sources. This estimate can be used for rough calculations. MOBILE6 can also provide annual milage accumulation estimates for specific ages and classes of vehicles. VMT estimates can vary, and for purposes other than rough estimates, you should obtain estimates specific to your needs.

Greenhouse Gas Emissions

Passenger vehicle - 5.5 metric tons carbon dioxide (CO_2) annually (= 1.5 metric tons carbon equivalent)

Source: Approximation for a typical passenger vehicle based on EPA calculation - see fact sheet #EPA420-F-05-004 on greenhouse gas (GHG) emissions from a passenger vehicle. This value includes emissions of carbon dioxide, methane, nitrous oxide, and hydro-fluorocarbons. The estimate is of vehicle emissions only (i.e., it does not include lifecycle emissions from fuel processing or distribution). Note: This estimate does not include vehicles over 8500 pounds (lbs).

CO_2 emissions from a gallon of gasoline	19.4 lbs
CO_2 emissions from a gallon of diesel fuel	22.2 lbs

Source: Calculation based on 40 CFR 600.113 and Intergovernmental Panel on Climate Change (IPCC) methodology - see fact sheet #EPA420-F-05-001.

Note: All estimates above are single point estimates, and have associated variation and uncertainty. In some cases it may be appropriate to use other values, or a range of values.

Global Warming Potentials

CO_2	1
CH_4	21
N_2O	310
HFC-134a	1,300 (HFC-134a is used in mobile source air conditioning)

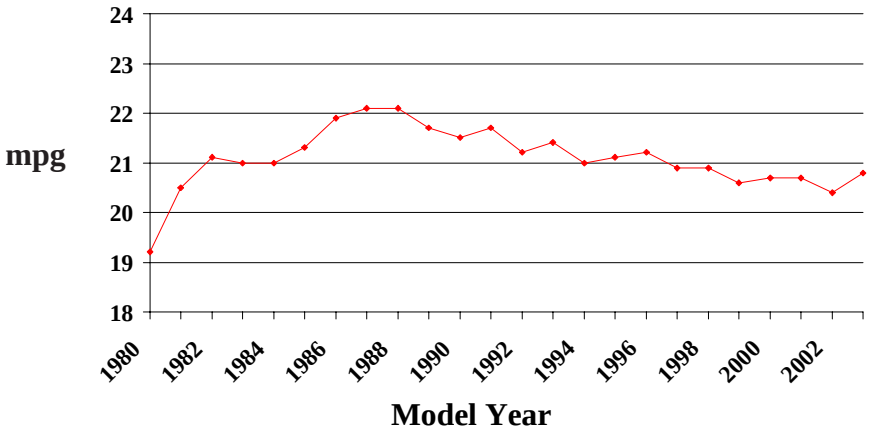
Source: IPCC "Second Assessment Report" (1996)

Conversions

1 metric ton of carbon equivalent = 3.667 metric tons CO_2 eq.
1 metric ton of CO_2 eq. = 0.2727 metric tons of carbon eq.
1 teragram = 1 million metric tons
1 kilogram = 2.205 pounds
metric ton = 1.102 tons

New Personal Vehicle Fuel Economy at 22-Year Low

("Real World" fuel economy, 15% lower than CAFE value)

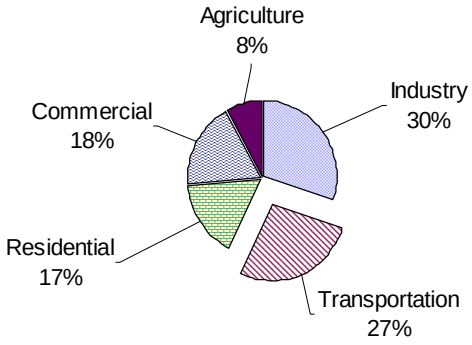


2003 Trends Report data - combined cars and trucks

Putting Transportation Greenhouse Gas Emissions Into Perspective

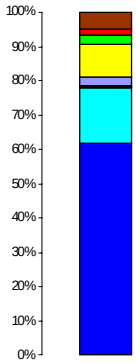
2002 U.S. Greenhouse Gas Emissions by Sector

Source: Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990 - 2002



2002 U.S. Transportation Sector by Category

Source: Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2002

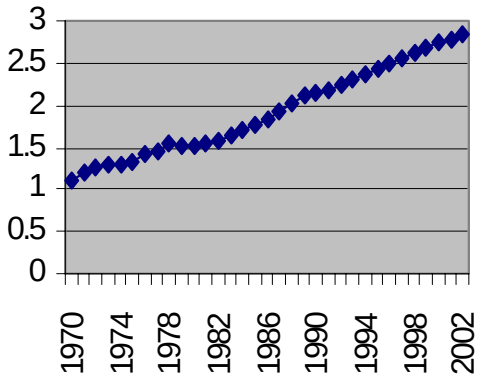


Source	mmt CO2e
Other nonroad	100.2
Rail	33.9
Boats	52.9
Aircraft	179.4
Mobile HFCs	40.3
Lubricants	10.8
Buses	8.5
Heavy Trucks	296.7
Passenger Cars, Light Trucks and Motorcycles (62% of transp. GHGs)	1153

mmt = million metric tons

Vehicle Miles Traveled Since 1970
(Trillions of Miles)

Source: FHWA Traffic Volume Trends, December, 2002



For More Information

You can access documents on greenhouse gas emissions on the Office of Transportation and Air Quality Web site at:

www.epa.gov/otaq/greenhousegases.htm

For further information on calculating emissions of greenhouse gases, please contact Ed Coe at:

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