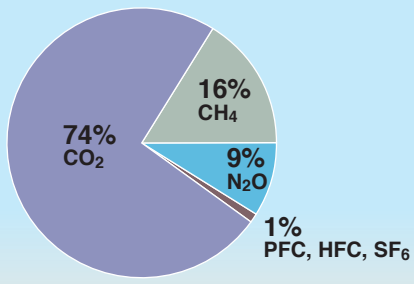
CARBON CITY

IDENTIFYING THE SOURCES OF CARBON DIOXIDE IN THE URBAN ENVIRONMENT

For most US cities, global warming pollution comes from three primary sources: electricity use in homes, businesses and factories; the burning of fossil fuels by industry; and pollution from cars, trucks SUVs and other transportation.

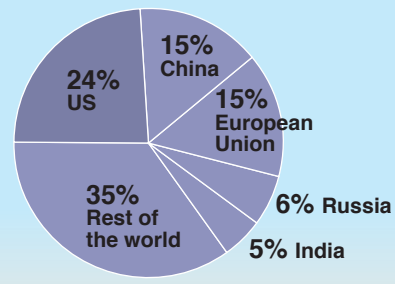
Carbon dioxide (CO_2) from burning fossil fuels makes up most of this pollution. Methane gas (CH_4) from rotting garbage at landfills and nitrous oxide (N_2O) from industry also contribute to global warming.*

Carbon dioxide (CO_2) makes up most of the greenhouse gas pollution that is warming the earth....



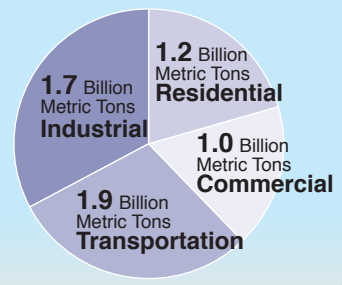
Global Greenhouse Gas Emissions by Gas (2000)≠

...Among nations, the US is the single largest source of CO2 pollution...

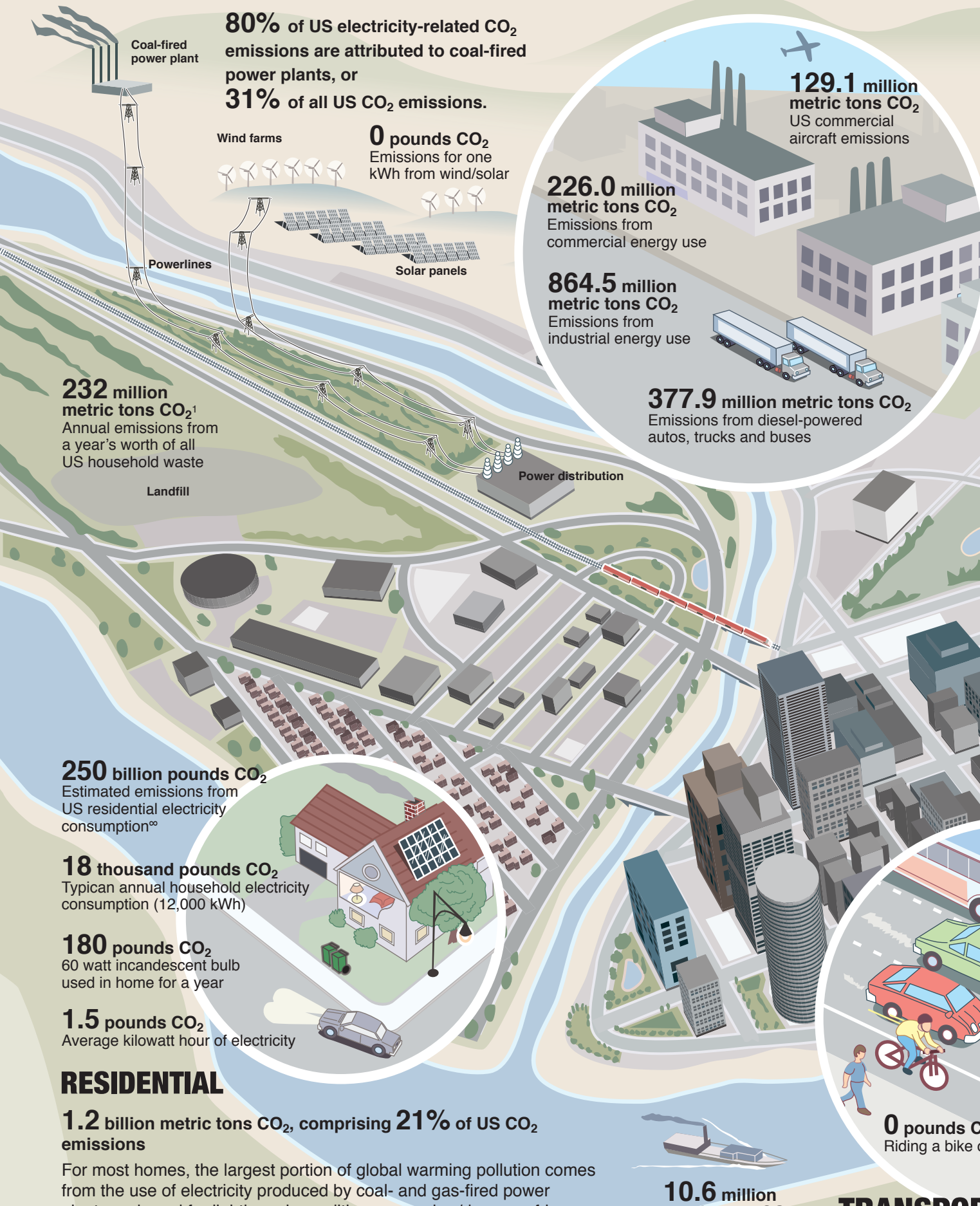


Global CO_2 emissions (2003)†

...Within the US, CO_2 pollution is produced in four key areas.



US CO_2 Emissions by Sector (2004)§



80% of US electricity-related CO_2 emissions are attributed to coal-fired power plants, or **31%** of all US CO_2 emissions.

0 pounds CO_2
Emissions for one kWh from wind/solar

232 million metric tons CO_2[1]
Annual emissions from a year's worth of all US household waste

129.1 million metric tons CO_2
US commercial aircraft emissions

226.0 million metric tons CO_2
Emissions from commercial energy use

864.5 million metric tons CO_2
Emissions from industrial energy use

377.9 million metric tons CO_2
Emissions from diesel-powered autos, trucks and buses

250 billion pounds CO_2
Estimated emissions from US residential electricity consumption∞

18 thousand pounds CO_2
Typican annual household electricity consumption (12,000 kWh)

180 pounds CO_2
60 watt incandescent bulb used in home for a year

1.5 pounds CO_2
Average kilowatt hour of electricity

10.6 million metric tons CO_2
Emissions from ships and boats

Public transportation:
One-half the CO_2 emissions of driving or riding in a private vehicle

17 thousand pounds CO_2
Driving 10,000 miles a year averaging 22 mpg

8.5 thousand pounds CO_2
Driving 10,000 miles a year averaging 44 mpg

0 pounds CO_2
Riding a bike or walking

20 pounds CO_2
One gallon of gas

INDUSTRIAL & COMMERCIAL

2.7 billion metric tons of CO_2 emissions from smokestacks, comprising 46% of US CO_2 emissions

Carbon dioxide from the burning of coal in power plants is the largest single source of global warming pollution in the industrial/commercial sector.

These power plants, which typically are located outside of city boundaries, provide electricity to businesses and factories.

Industrial pollution also comes from the burning of other fossil fuels suchas oil and natural gas. Commercial pollution comes from businesses that burn fossil fuels and use electricity from coal-fired power plants to produce light and heat and to run air conditioners and machinery.

RESIDENTIAL

1.2 billion metric tons CO_2, comprising 21% of US CO_2 emissions

For most homes, the largest portion of global warming pollution comes from the use of electricity produced by coal- and gas-fired power plants and used for lighting, air conditioners, washer/dryers, refrigerators and other appliances. Half of all electricity in the US is generated by coal-fired power plants which produce 2 lbs of CO_2 pollution for every kilowatt hour of power.

Many homes burn natural gas or oil in furnaces and water heaters, producing additional pollution. Un-recycled household garbage also causes pollution -rotting garbage in landfills creates methane, an extremely potent greenhouse gas.

TRANSPORTATION

1.9 billion metric tons CO_2 emissions, comprising 33% of US CO_2 emissions

Private vehicles such as cars, SUVs and pick-up trucks, are the largest source of global warming pollution in the transportation sector. Each gallon of gasoline burned in an engine emits roughly 20 pounds of CO_2. Other sources include buses, trucks, trains, container ships and other vehicles with internal combustion engines.

***For the purposes of this graphic, all pollution totals are given in carbon dioxide equivalents.**

Sources:
Unless otherwise noted below, all data for this graphic come from the Environmental Protection Agency's Global Warming Resource Center, at http://yosemite.epa.gov/oar/globalwarming.nsf/content/ResourceCenterToolsCalculators.html
≠ EPA, www.epa.gov/methanetomarkets
† http://www.dti.gov.uk/files/file32554.pdf; http://cdiac.ornl.gov/trends/emis/em_cont.htm
§ EIA, Emissions of Greenhouse Gases in the United States 2004, DOE/EIA - 0573 (2004) (Washington, DC, December 2005)
∞ http://yosemite.epa.gov/oar/globalwarming.nsf/content/ResourceCenterPublicationsGHGEmissionsUSEmissionsInventory2002.html

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