## Greenhouse gases: how do Western states compare?





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Narrative: This flow chart, created by the World Resources Institute, shows the sources of greenhouse gases in the U.S. economy and how they are produced. Nearly one third comes from providing electricity and heat to buildings, and more than a quarter is from transportation, mostly driving.

## Source: World Resources Institute

URL: http://www.wri.org/chart/us-greenhouse-gas-emissions-flow-chart This flow chart shows the sources and activities across the U.S. Notes: economy that produce greenhouse gas emissions. Energy use is by far responsible for the majority of greenhouse gases. Most activities produce greenhouse gases both directly, through on-site and transport use of fossil fuels, and indirectly from heat and electricity that comes "from the grid." Emissions data comes from the Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2003, U.S. EPA (using the CRF document). Allocations from "Electricity & Heat" and "Industry" to end uses are WRI estimates based on energy use data from the International Energy Agency (IEA, 2005). All data is for 2003. All calculations are based on CO2 equivalents, using 100year global warming potentials from the IPCC (1996), based on total U.S. emissions of 6,978 MtCO2 equivalent. Emissions from fuels in international bunkers are included under Transportation. Emissions from solvents are included under Industrial Processes. Emissions and sinks from land use change and forestry (LUCF), which account for a sink of 821.6 MtCO2 equivalent, and flows less than 0.1 percent of total emissions are not shown.



Narrative: Nationally, three quarters of GHG emissions come from three sectors: electricity generation, transportation, and industrial operations. GHGs have risen steadily since 1990, with growth slowing in the mid-2000s, partly due to efficiency improvements in transportation and electricity sectors, and partially due to a slowing economy. The Western states' source profile is very similar to that of the entire U.S.

Source:	World Resources Institute, Climate Indicators Tool,
URL:	http://www.wri.org/project/cait/; Database provided in direct communication
from Thomas Damassa, Climate and Energy Program, WRI.	
Notes:	Units are million metric tons of CO2 Equivalent.



Narrative: Here's another view of how the West compares to the U.S. as a whole. The 11 Western states are responsible for about 17 percent of the total GHGs. Without California, the Western states would be about 10 percent of nationwide GHGs. Some sources are more prominent in the West and particularly in California (shown in green). Transportation stands out as a major source in California. Fugitive emissions from oil and gas drilling is especially prominent in the Western states, accounting for 42% of the U.S. total.

Source: World Resources Institute, Climate Indicators Tool,

URL: http://www.wri.org/project/cait/; Database provided in private communication from Thomas Damassa, Climate and Energy Program, WRI.

Notes: Units are million metric tons of CO2 Equivalent. Fugitive emissions are difficult to quantify accurately. They are defined as "an intentional or unintentional release of gases from anthropogenic activities", and are primarily estimated for the oil and natural gas industries. New Mexico and Wyoming are estimated to have significant fugitive emissions because of the high level of fuel extraction and power production that occurs in both states.



Narrative: Because most GHGs come from combustion of fuels for electricity and transportation, economic activity is highly correlated with GHGs. Not surprisingly, California is the largest source of GHGs in the West. Interestingly, California, Oregon, and Washington differ from more inland states in their source profile. Transportation makes up roughly half of all GHGs, whereas for inland states like Wyoming, Arizona, and Utah, electricity generation is the predominant source. California, while making many efficiency improvements to its electric grid, is also the largest importer of electricity from out of state: 30% of CA's power comes from its northwest and southwest neighbors. Wyoming and Colorado on the other hand, export power.

Source:	World Resources Institute, Climate Indicators Tool,
URL:	http://www.wri.org/project/cait/; Database provided in private
communica	tion from Thomas Damassa, Climate and Energy Program, WRI.
	http://www.eia.gov/state/
Notes:	Units are million metric tons of CO2 Equivalent.



Narrative: Some states also have the capacity to absorb significant GHGs into forest systems and other potential GHG sinks. This slide illustrates how some states' land use and development policies reduce their overall GHG footprint. Most notable are Oregon, Washington, and Montana, with each state's net emissions reduced by roughly 35%, 50% and 90% respectively. While California's land sinks reabsorbed almost as many GHGs as Montana's did (~40 metric tons), the sheer size of California's footprint muted the reduction to only 10% of statewide GHGs.

Source:World Resources Institute, Climate Indicators Tool,URL:http://www.wri.org/project/cait/; Database provided in privatecommunication from Thomas Damassa, Climate and Energy Program, WRI.Notes:Units are million metric tons of CO2 Equivalent.

