Greenhouse Gases and Where They Come From

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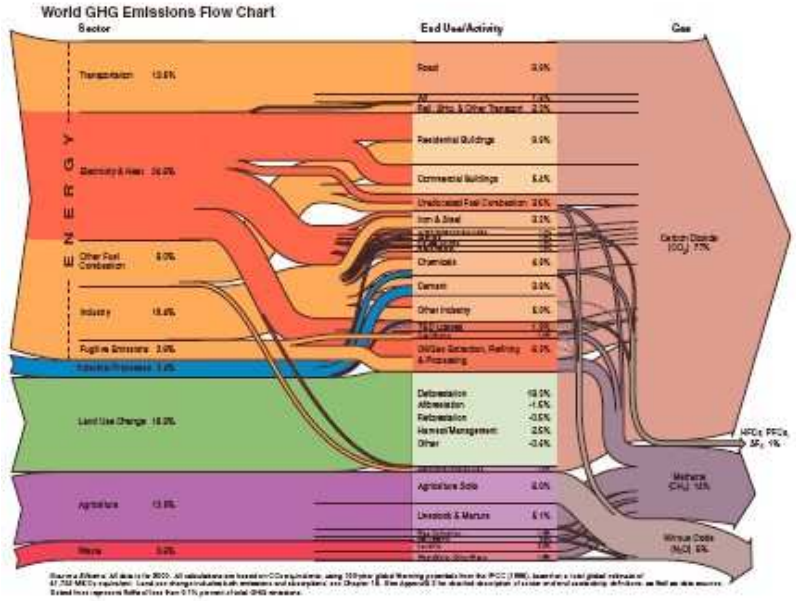
By Tim Herzog

As the 2006 UN Conference of the Parties to the Climate Convention (COP-12) begins, an overview of greenhouse gas (GHG) sources is helpful. GHGs come from almost every human activity. This figure is a comprehensive break-down of major sectors, activities and major greenhouse gases at the global level. The chart was recently included in the Stern Review on the Economics of Climate Change.



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U.S. version of this chart

Energy consumption is the major contributor of GHGs (61%). Within energy consumption, 40% is electricity and heat generation, another 20% is transportation and the remainder is building heat and industry. But energy consumption is by far not the only GHG source. Land-use change is the second largest contributor globally. Land-use change includes deforestation, reforestation (replanting in existing forested areas) and afforestation (creating new forested areas). Together, the activities under land-use change can be either a source or a sink of greenhouse gases; they can either contribute GHGs to or remove them from the atmosphere. Agriculture is another significant GHG source.

The major greenhouse gas is of course carbon dioxide (CO2) and nearly all CO2 comes from fossil fuels and land-use change. But methane (CH4) and nitrous oxide (N2O), which mostly come from agriculture and waste, are also significant GHGs and shouldn't be discounted. This diagram shows GHGs at the global level. But the mix of GHGs is much different in developed and developing countries. In developing countries, land-use change and agriculture contribute much greater shares of emissions than those shown here. In industrialized countries agriculture is usually a much smaller share--6% in the United States for example--and land-use change is often a sink.

Sources & Notes: All data is for 2000. All calculations are based on CO2 equivalents, using 100-year global warming potentials from the IPCC (1996), based on a total global estimate of 41,755 MtCO2 equivalent. Land use change includes both emissions and absorptions. See Appendix 2 in *Navigating the Numbers* for a complete description of sector and end use/activity definitions, as well as data sources. Dotted lines represent flows of less than 0.1% percent of total GHG emissions.

The content of this article has been repurposed for EarthTrends. The original version of this article appeared on the WRI homepage.

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