Chapter 10: Energy Use in the Transportation Sector

Overview

Given the estimated 239 million vehicles owned by U.S. residents in 2005, it is no surprise that the transportation sector consumes 28 percent of the nations' energy, coming in a close third behind the electricity and industrial sectors.¹ Although the sector includes the aviation, marine, pipeline, and the railroad industry; the majority of the energy used in transportation is associated with highway vehicles: 61 percent for personal vehicles, and 19 percent for the commercial trucking industry.² Within the last decade the percentage growth in energy consumption by the transportation sector outpaced all other sectors except the commercial sector, with which it was tied.³

For over a hundred years, vehicles have been predominately powered by internal combustion engines, using petroleum-based fuels derived from crude oil—commonly diesel fuel and gasoline. Many believe that the transportation industry will transition from petroleum-based fuels derived from traditional crude oil to entirely new fuels or petroleum-based fuels derived from non-conventional sources such as coal, tar sands, or shale. In 2007, petroleum-based fuels accounted for over 95 percent of the total energy used in the transportation sector.⁴

The combustion of petroleum-based fuels in vehicles releases large amounts of pollutants such as carbon monoxide, nitrogen oxides, and various hydrocarbons that produce ozone in the atmosphere. Fossil fuel combustion also produces large amounts of carbon dioxide, one of the greenhouse gases that the Intergovernmental Panel on Climate Change (IPCC) concludes is "very likely" to be causing global climate change (see Section 2.3). In fact, the transportation sector accounts for 33 percent of the carbon dioxide emitted in the U.S.⁵

¹ Energy Information Agency (EIA), October 2007, Energy Kid's Page: Transportation Energy Use: <u>http://www.eia.doe.gov/kids/energyfacts/uses/transportation.html</u> (accessed December 19, 2008).

² EIA, 2008, Transportation Energy Data Book: Table 2.7: spreadsheet link from <u>http://cta.ornl.gov/data/chapter2.shtml</u> (accessed December 22, 2008).

³ EIA, June 2008, Annual Energy Review: Energy Consumption by Sector: http://www.eia.doe.gov/emeu/aer/pdf/pages/sec2_4.pdf (accessed December 19, 2008).

⁴ Petroleum fuels that are blended with biomass fuels, such as E85 ethanol and biodiesel, are only counted for the percentage of petroleum contained in the fuel; see EIA, June 2008, Annual Energy Review: Energy Consumption by Sector: <u>http://www.eia.doe.gov/emeu/aer/pdf/pages/sec2_4.pdf</u> (accessed December 19, 2008).

⁵ Pew Center on Global Climate Change, May 2003, Reducing Greenhouse Gas Emissions from U.S. Transportation: <u>http://www.ethanolrfa.org/objects/documents/75/pewclimate.pdf</u> (accessed December 19, 2008).