



Estimates of State Energy-Related Carbon Dioxide Emissions

Because energy-related carbon dioxide (CO₂) constitutes over 80% of total emissions, the state energy-related CO₂ emission levels provide a good indicator of the relative contribution of individual states to total greenhouse gas emissions. The U.S. Energy Information Administration (EIA) emissions estimates at the state level for energy-related CO₂ are based on data contained in the State Energy Data System (SEDS).¹ The state-level emissions estimates are based on energy consumption data for the following fuel categories: three categories of coal (residential/commercial, industrial, and electric power sector); natural gas; and ten petroleum products including-- asphalt and road oil, aviation gasoline, distillate fuel, jet fuel, kerosene, hydrocarbon gas liquids (HGL), lubricants, motor gasoline, residual fuel, and other petroleum products.

The data are presented in three summary tables and in detailed state tables.

Table 1. Summary of State Energy-related Carbon Dioxide Emissions, 1990-2014 – A time series presents emissions estimates by state for 1990 to 2014. This table uses the fuel-based estimates to produce state totals.

Table 2. 2014 State Energy-related Carbon Dioxide Emissions by Fuel – The fuel-based estimates are developed from the primary fuel use of coal, natural gas, and petroleum for 2014. State-level energy consumption levels (measured in British thermal units, or Btu) are multiplied by national-level carbon emission factors (denominated in kilograms of CO₂ per million Btu as shown in Table 1 of this documentation) used by EIA to calculate national estimates of energy-related carbon dioxide emissions. No attempt is made to adjust national carbon dioxide emission factors by state. Additionally, the national-level inventory is based on the *Monthly Energy Review* data (MER)² series, and there are differences in how the MER and SEDS data systems aggregate certain petroleum products as well as industrial coal, so there will be differences in the national estimate and totals by state. For national estimates the reader should consult MER Section 12.

Table 3. 2014 State Energy-related Carbon Dioxide Emissions by Sector –Emissions from primary fuel inputs are estimated for 2014 by end-use sector and for the electric power sector. At the national level, EIA apportions electric power sector emissions to the end-use sectors based on the amount of electricity consumed by that sector.³ At the state level, electric power sector emissions are not shared

¹ See EIA website <http://www.eia.gov/state/seds/>

² See EIA website <http://www.eia.gov/totalenergy/data/monthly/>

³ The electric power sector consists of NAICS-22 generators whose primary business is to produce electricity. Emissions from generators in the industrial and commercial sectors whose primary business is not the generation of electricity remain in those respective end-use sectors.

out to the other sectors but are represented independently. This avoids complicated issues involving the flow of electricity across state lines that are not encountered when doing a national-level emissions estimate. In other words, regardless of where the electricity is consumed, the emissions from the primary energy consumed to generate the electricity are attributed to the state in which the generation occurred.

Carbon Sequestered by Nonfuel Uses of Energy – All three summary tables net out carbon, and hence carbon dioxide emissions, that is sequestered because a small portion of energy consumption is not combusted but rather used for nonfuel purposes. At the national level, carbon sequestered in nonfuel products is subtracted through a relatively complex process from total national-level emissions. Because of state-level data constraints, a simplified process is used to allocate the national-level nonfuel sequestration values to the individual states. Four separate methods are used, depending on the nonfuel source.

1. For petroleum products, such as asphalt and road oil and lubricants, where all uses are nonfuel and the sequestration rates are straightforward, the amount of nonfuel sequestered is directly calculated based on state-level data as measured in Btu and the related national-level carbon coefficients for the particular product.
2. For HGL, industry data are used to apportion the total national-level nonfuel sequestration amounts for HGL to the states.⁴
3. For petroleum products that sequester carbon other than items 1 and 2 above (petroleum coke, residual fuel, and distillate fuel), as well as natural gas, 80% is assigned to Texas and 20% is assigned to Louisiana.⁵
4. For the small amount of coal that is not combusted, the amount of coal consumed at coke plants by state is divided by the total coal consumed by coke plants in the United States and that percentage is used to allocate the national value.

Detailed Tables by State – Detailed state tables show emissions by fuel for each sector. These tables are from 1980.

⁴American Petroleum Institute, *Sales of Natural Gas Liquids and Liquefied Refinery Gases*. (various years). That data series has been discontinued and data have been updated using analyst's judgment.

⁵Earlier versions of this data series employed NAICS 325 Chemical Manufacturing value-added ratios to apportion this sequestered carbon.

