



Documentation for estimates of state energy-related carbon dioxide emissions

Because energy-related carbon dioxide (CO₂) accounts for more than 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 in the State Energy Data System (SEDS).¹ The state-level emissions estimates are based on energy consumption data for the following fuel types

- Four categories of coal
 - Residential/commercial sector
 - Industrial sector coking
 - Industrial sector
 - Electric power sector
- Natural gas
- Eighteen petroleum products
 - Asphalt and road oil
 - Aviation gasoline
 - Distillate fuel
 - Jet fuel
 - Kerosene
 - Hydrocarbon gas liquids (HGL)
 - Lubricants
 - Motor gasoline
 - Petrochemical feedstocks
 - Petroleum coke
 - Residual fuel oil
 - Waxes
 - Special naphtha
 - Still gas
 - Unfinished oils
 - Miscellaneous products
 - Natural gasoline
 - Other petroleum products

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

Carbon sequestered by nonfuel uses of energy

All three summary tables subtract sequestered carbon, and so by default, carbon dioxide emissions, because a small portion of energy consumption is not combusted but instead used for nonfuel purposes. At the national level, carbon sequestered in nonfuel products is subtracted from total national-level emissions through a relatively complex process. Because of state-level data constraints, EIA uses a simplified process to allocate the national-level nonfuel sequestration values to the individual states. EIA uses four methods, depending on the nonfuel source.

1. For petroleum products, such as asphalt and road oil and lubricants, with only nonfuel uses and that have straightforward sequestration rates, 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 product.
2. For HGL, industry data are used to allocate to each state its share of the total national-level nonfuel sequestration amounts.²
3. For petroleum products that sequester carbon and are not accounted for in Items 1 and 2 listed above (petroleum coke, residual fuel, and distillate fuel) and natural gas, 80% is assigned to Texas and 20% is assigned to Louisiana.
4. For the small amount of coal that is not combusted, EIA allocates the national value by dividing the amount of coal consumed at coke plants by state by the total coal consumed by coke plants in the United States.

Adjustment factor

EIA adds an adjustment factor to account for the difference between the totals of all the states and the national-level estimate in the *Monthly Energy Review*. This adjustment factor is applied to each state in proportion to its emissions share of the national total. For example, in 2017, the adjustment factor for the entire United States was -33 million metric tons. The adjustment factor for Texas was -4.5 million metric tons. In 2016, Texas's share of U.S. emissions was about 14%.

Output tables

See *Introduction and Key Concepts: State Energy-Related Carbon Dioxide Emissions Tables* for a description of the output tables.

² American Petroleum Institute, *Sales of Natural Gas Liquids and Liquefied Refinery Gases*. (various years). This data series has been discontinued and data have been updated using the analyst's judgment.

Table 1. Carbon dioxide coefficients for state emissions calculations (2010-2017)

kilograms/million Btu

Fuel type	2010	2011	2012	2013	2014	2015	2016	2017
Coal (residential/commercial)	94.28	94.28	94.28	94.28	94.28	94.28	94.28	94.28
Coal (industrial coking)	93.89	93.89	93.89	93.89	93.89	93.89	93.89	93.89
Coal (industrial other)	94.66	94.66	94.66	94.66	94.66	94.66	94.66	94.66
Coal (electric power sector)	95.52	95.52	95.52	95.52	95.52	95.52	95.52	95.52
Natural gas	53.06	53.06	53.06	53.06	53.06	53.06	53.06	53.06
Asphalt and road oil	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Aviation gasoline	69.19	69.19	69.19	69.19	69.19	69.19	69.19	69.19
Distillate fuel oil	73.15	73.15	73.15	73.15	73.15	73.15	73.15	73.15
Jet fuel	70.88	70.88	70.88	70.88	70.88	70.88	70.88	70.88
Kerosene	72.31	72.31	72.31	72.31	72.31	72.31	72.31	72.31
Hydrocarbon gas liquids	62.00	61.64	61.82	61.93	61.80	61.99	61.82	61.82
Lubricants	74.21	74.21	74.21	74.21	74.21	74.21	74.21	74.21
Motor gasoline	71.26	71.26	71.26	71.26	71.26	71.26	71.26	71.26
Petrochemical feedstocks	69.52	69.29	68.92	68.37	68.37	68.37	68.37	68.37
Petroleum coke	102.12	102.12	102.12	102.12	102.12	102.12	102.12	102.12
Residual fuel oil	78.80	78.80	78.80	78.80	78.80	78.80	78.80	78.80
Waxes	72.64	72.64	72.64	72.64	72.64	72.64	72.64	72.64
Special naphtha	72.82	72.82	72.82	72.82	72.82	72.82	72.82	72.82
Still gas	64.20	64.20	64.20	64.20	64.20	64.20	64.20	64.20
Unfinished oils	74.54	74.54	74.54	74.54	74.54	74.54	74.54	74.54
Miscellaneous products	74.54	74.54	74.54	74.54	74.54	74.54	74.54	74.54
Natural gasoline	66.88	66.88	66.88	66.88	66.88	66.88	66.88	66.88
Other petroleum	74.84	74.84	74.84	74.84	74.84	74.84	74.84	74.84

Source: Energy Information Administration.