

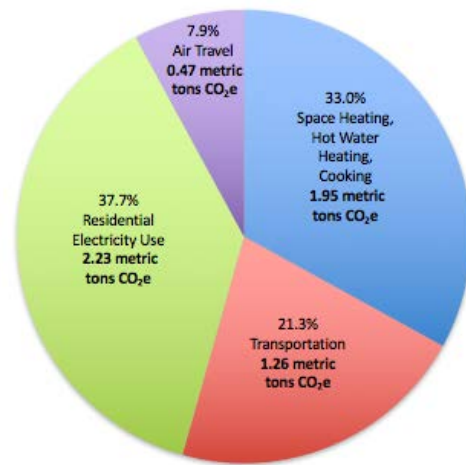
Carbon Footprint Calculations for a Student Living in the USA

The average annual energy-related carbon footprint of an American student living in the USA is about **5.9 metric tons of carbon dioxide (tCO₂e)** according to the latest information from the U.S. Department of Energy.ⁱ

General assumptions include:

1. Per capita emissions are the total U.S. emissions divided by the U.S. population, and adjusted to be lower than average for a student.ⁱⁱ
2. The average electricity-related emissions are 31.1% from coal, 41.9% from petroleum, and 26.7% from natural gas, emitting 0.59 kg CO₂e per kWh.ⁱⁱⁱ
3. 740 million passenger trips on airlines crossed 72.8 billion miles on commercial airlines.^{iv} A student travels fewer miles by air as an average American, assumed to be 2,500 miles, with 20% of miles traveled on short haul flights and 80% on one medium haul flight.^v
4. A student owns a car and travels 6,000 miles annually^{vi} averaging 23.4 miles per gallon.^{vii}
5. The average home in the U.S is 1,850 square feet. Students live in or share spaces that average 600 square feet.

U.S. Student Carbon Footprint



Greenhouse Gas (GHG) Emissions are categorized as Scope 1, 2 or 3:

Scope 1 CO₂ Emissions – Space Heating, Hot Water Heating, Cooking

1.95 tCO₂e

Scope 1 emissions are all direct GHG emissions. A household may combust fuel on site for cooking and space and/or water heating. Cooking and heating make up 34.6% of an average American household's energy use. Because cooking, space and water heating energy services are also done with electricity, the carbon footprint from stationary sources can vary by household.

Scope 1 Emissions – Transportation

1.26 tCO₂e

Mobile combustion sources include fuel consumed by 6,000 miles of travel via an automobile averaging 23.4 miles per gallon, operated by the household. Students travel on average 50% of average Americans.

Scope 2 Emissions – Electricity Consumption

2.22 tCO₂e

Scope 2 emissions are all indirect GHG emissions from the consumption of purchased electricity, heat, or steam. The American household consumes 11,320 kilowatt-hours (kWh) of electricity.^{viii} The precise mix of electricity varies by region. On average the emissions are 0.59 kg CO₂e per kWh of electricity. The electricity consumed by student is assumed to be 1/3rd of average.

Scope 3 emissions includes those associated with travel by economy class.

Endnotes

ⁱ Energy Information Agency. 2017. Energy-Related Carbon Dioxide Emissions at the State Level, 2000-2014. January 2017, U.S. Department of Energy.

ⁱⁱ Geography can vary the carbon footprint because of the different mixes of electricity, heating fuels and demand, and transportation patterns.

ⁱⁱⁱ Energy Information Agency. 2017. Energy-Related Carbon Dioxide Emissions at the State Level, 2000-2014. January 2017, U.S. Department of Energy. June 2015.

^{iv} U.S. Department of Transportation, Bureau of Transportation Statistics, Office of Airline Information, T-100 Market Data, available at www.transtats.bts.gov

^v Greenhouse gas Emissions factor data comes from the U.S. Environmental Protection Agency's Center for Corporate Climate Leadership. EPA uses three categories of air travel—short (<300 miles), medium (>300 miles, < 2,300 miles), and long haul (>2,300 miles). EPA estimates emissions factors for CO₂, CH₄, and N₂O per passenger-mile. For short haul the emissions factors are 0.251 kg CO₂/passenger-mile, 0.0039 kg C₄/passenger-mile, 0.0083 kg N₂O/passenger-mile for short haul flights, 0.143 kg CO₂/passenger-mile, 0.0000 kg C₄/passenger-mile, 0.0047 kg N₂O/passenger-mile for medium haul flights, and 0.167 kg CO₂/passenger-mile, 0.0006 kg C₄/passenger-mile, 0.0056 kg N₂O/passenger-mile for long haul flights. The 100-year global warming potential of CH₄ is 25 and N₂O is 298.

^{vi} Department of Energy. 2016. Average Annual Vehicle Miles Traveled by Major Vehicle Categories. Alternative Fuels Data Center.

^{vii} Department of Energy. 2016. Average Fuel Economy of Major Vehicle Categories. June 2015. Alternative Fuels Data Center.

^{viii} EIA. 2013. Heating and cooling no longer majority of U.S. home energy use. Residential Energy Consumption Survey, U.S. Department of Energy.