

Greenhouse Gas Equivalencies Calculator

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United States
Environmental Protection
Agency

GHG Equivalencies Calculator

- Simple, web-based tool that *translates* GHG reductions *into easily understood metrics*
 - gallons of gasoline,
 - barrels of oil,
 - tanker trucks of gasoline,
 - BBQ propane cylinders,
 - tons of waste recycled,
 - annual household electricity,
 - trees planted,
 - annual vehicle emissions
 - railcars of coal
- Helps stakeholders and citizens process actions taken by governments and the private sector

Why Do We Need a Calculator?

- Greenhouse Gases often talked about in terms of MMT (million metric tons) of Carbon Dioxide Equivalent (aka Terragrams of CO₂)
 - US Emissions in 2005—7260 MMT
 - NC's 2003 Emissions from Fossil Fuels—144 MMT
 - Durham County, NC 2005 emissions—6.2 MMT

- Pop Quiz: What is 1 MMT equivalent to?
 - A: 13,000 tanker trucks of gasoline
 - B: Electricity use of 128,000 households
 - C: 41.7 million BBQ propane cylinders
 - D: 5000 railcars full of coal
 - E: Carbon stored by 8000 acres of forest

User Enters Available Data

Greenhouse Gas Equivalencies Calculator - Microsoft Internet Explorer

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Highlights

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Carbon Equivalency Calculator

Click Here to Access the Carbon Equivalency Calculator Tool

UN Framework Convention on Climate Change

Click Here to Access Technology Transfer Related

If you have already estimated the quantity of emission reductions (e.g., metric tons of carbon dioxide equivalent), please go directly to the table below. If the starting point for your conversion calculation is (a) gallons of gasoline, (b) kilowatt-hours of electricity, or (c) number of cars and light trucks (rather than quantity of greenhouse gas), please [click here](#).

Enter the estimates of greenhouse gas emissions that you wish to convert, by individual gas or carbon equivalent.	Unit	Gas	
<input type="text" value="100000"/>	Tons	CO ₂	Calculate
<input type="text" value="500"/>	Tons	CH ₄	
<input type="text"/>	Tons	N ₂ O	
<input type="text"/>	Pounds Metric Tons Kilograms	HFC-23	
<input type="text"/>	Tons	CF ₄	Clear Fields
<input type="text"/>	Tons	SF ₆	
<input type="text"/>	Tons	Carbon Equivalent	

GHG Equivalencies Estimated

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Your total greenhouse gas reduction is Metric Tons of Carbon Dioxide Equivalent.

This is equivalent to one of the following:

<input type="text" value="21,698"/>	Passenger cars not driven for one year	Click Here for Calculations and References
<input type="text" value="17,933"/>	Passenger cars and light trucks not driven for one year	Click Here for Calculations and References
<input type="text" value="11,417,302"/>	Gallons of gasoline	Click Here for Calculations and References
<input type="text" value="233,125"/>	Barrels of oil	Click Here for Calculations and References
<input type="text" value="1,344"/>	Tanker trucks filled with gasoline	Click Here for Calculations and References
<input type="text" value="12,868"/>	Household electricity use for one year (number of households)	Click Here for Calculations and References
<input type="text" value="2,570,357"/>	Number of tree seedlings grown for 10 years	Click Here for Calculations and References

Peer-Reviewed Calculations & References

http://www.usctcgateway.net - Gallons of Gasoline - Microsoft Internet Explorer

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Gallons of Gasoline

Average heat content of conventional motor gasoline is 5.253 million btu per barrel (EIA 2002a). Average carbon coefficient of motor gasoline is 19.34 kg carbon per million btu (EIA 2002b). Fraction oxidized to CO₂ is 99 percent (IPCC/UNEP/OECD/IEA 1997).

Carbon dioxide emissions per barrel of gasoline were determined by multiplying heat content times the carbon coefficient time the fraction oxidized times the ratio of the molecular weight ratio of carbon dioxide to carbon (44/12). A barrel equals 42 gallons.

$$5.253 \text{ mmbtu/barrel} * 19.34 \text{ kg C/mmbtu} * 0.99 * 1 \text{ barrel}/42 \text{ gallons} * 44 \text{ g CO}_2/12 \text{ g C} * 1 \text{ metric ton}/1000 \text{ kg} = 8.78 * 10^{-3} \text{ metric tons CO}_2/\text{gallon}$$

Sources:

EIA (2002a). *Annual Energy Review 2001*. Energy Information Administration, U.S. Department of Energy, Washington, DC. DOE/ELA-0384(01).
<http://www.eia.doe.gov/emeu/>

Done Internet

Alternate starting points

http://www.usctcgateway.net - Greenhouse Gas Equivalencies Calculato...

Greenhouse Gas Equivalencies Calculator

Please (1) select "gallons of gasoline," "kilowatt-hours of electricity," or "cars and light trucks not driven for one year"; (2) enter the quantity, and (3) click on "Return to Main Calculator" to convert your value to Carbon Dioxide Equivalent. If you want to see the basis for the conversion factors, click on "Click Here for Calculations and References."

There are a number of [other web-based calculators](#) that can estimate greenhouse gas emission reductions for a variety of other activities.

gallons of gasoline
gallons of gasoline
kilowatt-hours of electricity
cars and light trucks

[Click Here for C](#)

Return to Main Calculator

Internet

Examples of Use

“We will start with a framework called “15 by 15,” which will reduce electricity consumption by 15 percent below the forecasted level in 2015. ... It is estimated that 15 by 15 alone would result in an annual carbon dioxide reduction of about 12.8 million tons. That’s the equivalent to removing 2.5 million cars from the road.”

NY Governor Elliot Spitzer, April 19, 2007

Examples of Use

Over the expected 30-year lifetime of the system, the combined solar-generated electricity will reduce emissions of carbon dioxide by 4,200 tons. These emissions reductions are the equivalent to planting 1,170 acres of trees, removing almost 855 cars, or not driving 10.5 million miles on California's roadways.

Napa, CA's Lake Hennesy Solar Pump Station

Access and Updates

- Currently housed on US Climate Technology Cooperation website
 - <http://www.usctcgateway.net/tool>
- Updating conversion factors, equations, and terminology to improve consistence across EPA programs and calculators
 - Updates Complete by Summer 2007
- Will move to EPA Website
 - Estimated late 2007

For More Information

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