

## METRICS FOR GO ZERO CALCULATOR

### Home and Energy Use

FORMULA [xm=c] lbs

#### *Electricity*

\_\_\_(x)\_\_\_ Kilowatt-hours (kWh) per year

Or, if you don't know your average annual use, please select your home size:

\_\_\_Single family home \_\_\_Town home \_\_\_Apartment

(Calc: Single Family Home x = 11,827, Town home x = 6,505, Apartment x = 5,990)

(Calc: m=1.37 lbs)

#### *Natural Gas*

\_\_\_(x)\_\_\_ therms per year

Or, if you don't know your average annual use, please select your home size:

\_\_\_Single family home \_\_\_Town home \_\_\_Apartment

(Calc: Single Family Home x = 944.84, Town home x = 872.95, Apartment x = 369.72)

(Calc: m=11.71 lbs)

#### *Heating Oil*

\_\_\_(x)\_\_\_ gallons per year

Or, if you don't know your average annual use, please select your home size:

\_\_\_Single family home \_\_\_Town home \_\_\_Apartment

(Calc: Single Family Home x = 801, Town home x= 728, Apartment x= 466)

(Calc: m=22.39 lbs)

#### *Propane*

\_\_\_(x)\_\_\_ gallons per year

Or, if you don't know your average annual use, please select your home size:

\_\_\_Single family home \_\_\_Town home \_\_\_Apartment

(Calc: Single Family Home x = 515, Town home N/A x = 0, Apartment x = 87)

(Calc: m=12.4 lbs)

#### *Waste*

Garbage \_\_\_household average \_\_\_individual average

(Calc: Household x = 365 days, Individual x = 365/2 days)

(Calc: m=4.4 lbs)

Recycling \_\_\_household average \_\_\_individual average

(Calc: Household x = 788.4, Individual x = 423.4)

(Calc: m=2 lbs)

## Auto Transportation

Automobiles

FORMULA  $[zm+a=c]$  lbs

### Vehicle 1:

\_\_\_(x)\_\_\_ miles driven per year

*Hint: 11,700 miles per year, per vehicle is about average in the U.S.*

The fuel efficiency of my vehicle is \_\_\_(y)\_\_\_ miles per gallon (mpg).

Or, if you don't know your vehicle's fuel efficiency, please select its size:

Does your vehicle have an air conditioner? Yes / No

(Calc: Compact or Smaller  $y = 25.2$ , Midsize Sedan  $y = 22.2$ , Large Sedan  $y = 21.2$ , Station

Wagon  $y = 23.8$ , Truck or Van  $y = 17.2$ , Minivan  $y = 20.1$ , Sport Utility  $y = 18.8$ )

(Calc: Yes ( $a=194.9$ ) / No ( $a=0$ ))

(Calc:  $x/y = z$ )

(Calc:  $m=20$  lbs)

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### Air Travel

FORMULA  $[xm=c]$  lbs

\_\_\_(x)\_\_\_ air miles flown per year.

(Calc:  $m=0.4236$  lbs)

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## STEP TWO -- CALCULATE YOUR IMPACT

### Calculate Your Impact:

FORMULA  $[(\text{sum of all } c)/m=i]$  tons

Your estimated CO2 emissions is \_\_\_i\_\_\_ tons per year.

(calc:  $m=2,000$ )

You can help to offset your impact by planting \_\_\_t\_\_\_ trees.

FORMULA  $[i/m=t]$  trees

(Calc:  $m=1.33$  tons)

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## STEP THREE – GO CARBON ZERO

FORMULA  $[5i+5=d]$  USD

Tree Planting	\$d.00
Program Administration	\$5.00
Total	\$ [d.00+5.00]

## Sources

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### **Electricity**

Carbon Coefficient: 1.37 pounds CO<sub>2</sub>/kilowatt-hour

Source for average residential consumption of electricity: Energy Information Administration: Residential Energy Consumption Survey 2001 - Household Energy Consumption and Expenditures Tables available at:

[http://www.eia.doe.gov/emeu/recs/byfuels/2001/byfuels\\_2001.html](http://www.eia.doe.gov/emeu/recs/byfuels/2001/byfuels_2001.html).

Source for national average carbon dioxide emission factor of 1.37 pounds per kWh is calculated from Energy Information Administration/Electric Power Annual 2003, Table ES (December 2004).

### **Natural Gas**

Carbon Coefficient: 12 pounds CO<sub>2</sub>/cf

Source for average residential consumption of natural gas: Energy Information Administration: Residential Energy Consumption Survey 2001 - Household Energy Consumption and Expenditures Tables available at:

[http://www.eia.doe.gov/emeu/recs/byfuels/2001/byfuels\\_2001.html](http://www.eia.doe.gov/emeu/recs/byfuels/2001/byfuels_2001.html)

Updated source for carbon coefficients U.S. EPA, US Inventory of Greenhouse Gas Emissions and Sinks: 1990-2003, Annex 2.1, Table 2-17.

### **Home Heating Oil**

Carbon Coefficient: 22.39 pounds CO<sub>2</sub>/gallon

Source for average residential consumption of no. 2 distillate fuel (home heating oil): Energy Information Administration: Residential Energy Consumption Survey 2001 - Household Energy Consumption and Expenditures Tables available at:

[http://www.eia.doe.gov/emeu/recs/byfuels/2001/byfuels\\_2001.html](http://www.eia.doe.gov/emeu/recs/byfuels/2001/byfuels_2001.html).

Updated source for carbon coefficients: U.S. EPA, US Inventory of Greenhouse Gas Emissions and Sinks: 1990-2003, Annex 2.1, Table 2-17.

### **Propane**

Carbon Coefficient: 12.40 lbs CO<sub>2</sub> /gallon

The factors in the U.S. GHG Inventory state that liquefied petroleum gases (LPG) have a carbon content of 17.20 Tg Carbon / QBtu – propane makes up the majority proportion of what is considered LPG. With a conversion, propane has a factor of 12.40 lbs CO<sub>2</sub>/gallon.

### **Waste**

Garbage Carbon Coefficient: 4.4 lbs/day/household.

Source: U.S. Environmental Protection Agency, 1998. Greenhouse Gas Emissions from Selected Materials in Municipal Solid Waste

(<http://yosemite.epa.gov/OAR/globalwarming.nsf/content/ActionsWasteToolsWARM.html>)

"Typical" annual CO<sub>2</sub> emissions of 4,800 lbs were estimated based on a household of two people, per capita waste generation of 4.44 lbs/day, a 25 percent recycling rate, no source reduction, and the national average mix of recyclables.

### **Auto Transportation**

Carbon Coefficient: 20.00 pounds CO<sub>2</sub>/gallon

Source for average vehicle mile travel Bureau of Transportation Statistics: Transportation Statistics Annual Report (September 2004)

Source for average 22 mpg per latest stats available from Bureau of Transportation Statistics at [http://www.bts.gov/publications/national\\_transportation\\_statistics/2005/html/table\\_04\\_23.html](http://www.bts.gov/publications/national_transportation_statistics/2005/html/table_04_23.html).

Updated source for carbon coefficients: U.S. EPA, US Inventory of Greenhouse Gas Emissions and Sinks: 1990-2003, Annex 2.1, Table 2-17.

### **Air Travel**

Carbon Coefficient: 0.424 lbs of CO<sub>2</sub> per mile flown

Air travel definitions and factors are from the GHG Protocol Mobile Combustion Tool.

The emissions factors for short and long haul flights are originally from UK DEFRA.

Long and short flights can be estimated using the GHG Protocol Initiative online tools at

<http://www.ghgprotocol.org>

The carbon dioxide footprint is the sum of all the above calculations (in lbs), resulting in an estimate of the carbon dioxide that is produced by home energy use, auto transportation, and air travel. The total number of lbs is converted to short tons. On average, a tree planted as part of the Fund's Carbon Zero program sequesters approximately 1.33 tons of CO<sub>2</sub> equivalent over a 100-year period. The cost to plant and monitor each tree is approximately \$5.00.