

Go Green Workshop

GOING GREEN WHILE IN THE RED - CARBON FOOTPRINT 101

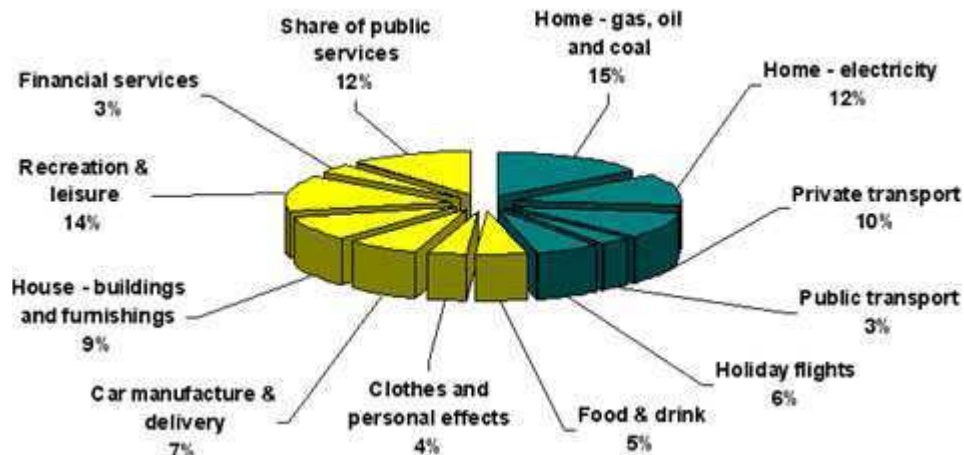
THE PROBLEM

The Intergovernmental Panel on Climate Change (IPCC) released its latest assessment of climate change in February, 2007. It concluded that the latest evidence of global warming is unequivocally the worst ever. It also stated that the reason for this disturbing information is 90%+ human-based. Our carbon footprints are measured in terms of carbon dioxide emitted.

Fact: The average American emits 22 tons of carbon dioxide every year, compared to the worldwide average of just 5 tons per year.

A **carbon footprint** is a measure of the impact our activities have on the environment, and in particular climate change. It relates to the amount of greenhouse gases produced in our day-to-day lives through burning fossil fuels for electricity, heating and transportation etc.

The carbon footprint is a measurement of all greenhouse gases we individually produce and has units of tonnes (or kg) of carbon dioxide equivalent.



The pie chart above shows the main elements which make up the total of a typical person's carbon footprint in the developed world.

A carbon footprint is made up of the sum of two parts, the primary footprint (shown by the green slices of the pie chart) and the secondary footprint (shown as the yellow slices).

1. The **primary footprint** is a measure of our direct emissions of CO₂ from the burning of fossil fuels including domestic energy consumption and transportation (e.g. car and plane). We have direct control of these.

2. The **secondary footprint** is a measure of the indirect CO₂ emissions from the whole lifecycle of products we use - those associated with their manufacture and eventual breakdown. To put it very simply – the more we buy the more emissions will be caused on our behalf.

A ton of carbon is released when you:

- Travel 5,000 miles in an airplane
- Drive 2,500 miles in a medium-sized car
- Cut down and burn a tree that was about one foot in diameter and 40 feet tall

Why are individual carbon footprints so alarmingly high?

It's the way we live. We abuse the planet's natural resources;

- We cause huge amounts of air, water and land pollution;
- We are incredibly lazy in our home and work habits;
- We produce enormous and completely unjustifiable amounts of waste materials;
- We have been resistant to embrace alternative energy sources;
- We gorge ourselves on animal-based diets that not only destroy our health, but also cause unparalleled amounts of deforestation and shrink our fresh water supplies to nothing.

The Facts

- The principal greenhouse gases released as a direct result of human activities are Carbon Dioxide (CO₂), Methane (CH₄), Nitrous Oxide (N₂O), and several types of fluorinated gases.
- These gases are responsible for trapping heat in the atmosphere and causing global warming.
- There has been a 0.9 F (0.5 C) rise in the average sea temperatures over the last four decades;
- Between 1965 and 1995, over 20,000 square kilometers of ice melted in the Arctic;
- Over the last 100 years, the global sea levels have risen on average between 10 and 25 cm.
- Surface temperatures worldwide have risen 0.7 C over the past 100 years.
- Average annual Arctic temperatures have risen at twice the rate of the rest of the globe over the past century.
- There is a worldwide trend of glacial retreat.

THE SOLUTION

What is a Carbon Footprint Calculator?

There are carbon footprint calculators available for free all over the Internet. A carbon footprint calculator has you to enter several variables based upon your particular lifestyle - things like: how much your electricity bill is each month; how many miles per week do you drive; how many loads of clothing do you wash per week; the type of vehicle you drive and the like. It takes about 10 minutes to answer all of the questions and then you are presented with your carbon footprint information.

The carbon footprint calculators do not ask any personal information - nothing about identity, income, birth dates or anything like that. The questions are all "carbon based" and aimed solely at determining what you came to find out: how big your carbon footprint is. Carbon footprint calculators are easy and fun to use. Even if the results are not what you want to hear, you will feel really good to know that at least you are doing your part to become aware and begin to make changes to go green and create a sustainable environment for the entire world.

Calculate your Carbon Footprint using one of the websites listed.

- **Easy to use**, from the Nature Conservancy at www.nature.org/initiatives/climatechange/calculator/
- **More comprehensive**, from the Carbon Footprint at www.carbonfootprint.com
- **Once you understand how it works**, you can create an assignment using this exercise, the results, and the solution to reducing the carbon footprint.

HOW TO REDUCE ONE'S CARBON FOOTPRINT

The obvious ways to negate these devastating problems is to endeavor to lead greener lives. We have to offset our carbon footprints. We have to utilize alternative energy sources - ones that are clean, renewable and environmentally-friendly. Following are some tips that you can initiate within your life immediately:

By taking action and embracing renewable energy sources, we are able to decrease the size of our carbon footprints and help save our planet and save the LAVC money\$\$\$.

Easy Green Living tips to use for discussion with your students in how they can reduce their Carbon Footprint:

1. **TIP: Travel light.** Walk or bike instead of driving a car. Cars and trucks run on fossil fuels, which release carbon dioxide into the atmosphere. In the United States, automobiles produce over 20 percent of total carbon emissions. Walk or bike and you save one pound of carbon for every mile you travel.
2. **TIP: Teleconference instead of flying.** For office meetings, if you can telephone or videoconference, you will save time, money, and carbon emissions. Airplanes pump carbon emissions high into the atmosphere, producing 12 percent of transportation sector emissions.
3. **TIP: See the light.** Use compact fluorescent light bulbs. These energy-efficient bulbs help fight climate change because they reduce the amount of fossil fuels that utilities burn. You will save 100 pounds of carbon for each incandescent bulb that you replace with a compact fluorescent, over the life of the bulb.
4. **TIP: Recycle and use recycled products.** Products made from recycled paper, glass, metal and plastic reduce carbon emissions because they use less energy to manufacture than products made from completely new materials. For instance, you'll save two pounds of carbon for every 20 glass bottles that you recycle. Recycling paper also saves trees and lets them continue to reduce climate change naturally as they remain in the forest, where they remove carbon from the atmosphere.
5. **TIP: Inflate your tires.** If you own a car, it will get better gas mileage when the tires are fully inflated, so it will burn less gas and emit less carbon. Check your automobile monthly to ensure that the tires are fully inflated. Follow this tip and save 300 pounds of carbon dioxide for every 10,000 miles you drive.
6. **TIP: Plant native trees.** Trees absorb carbon dioxide from the air and use it as their energy source, producing oxygen for us to breathe. A tree in the temperate zone found between the tropics and the polar circles can remove and store 700 to 7,000 pounds of carbon over its lifetime. A tree that shades a house can reduce the energy required to run the air conditioner and save an additional 200 to 2,000 pounds of carbon over its lifetime.

7. **TIP: Turn down the heat.** Heating and air conditioning draw more than half of the energy that a home uses in the United States. Turn down the heat or air conditioning when you leave the house or go to bed. You can easily install a programmable thermostat that can save up money and carbon.
8. **TIP: Buy renewable energy.** Electricity generation produces 40 percent of carbon emissions from the United States. A growing number of utilities generate electricity from renewable energy sources with solar panels, windmills and other technologies. If your utility offers renewable energy, buy it. If not, send them a message asking for clean energy.
9. **TIP: Act globally, eat locally.** If you shop at a supermarket, the food you buy may travel in a plane from the other side of the world, burning fossil fuels the entire trip. Shop at a local farmers' markets and you will find fresh and healthy food, and help save our climate.

Super Green Tips:

- Purchase a solar powered, biofuel-driven or hybrid vehicle.
- Purchase a solar energy system for your home.
- Purchase solar powered hot water heaters and any other alternative energy products that you see available and need.
- Plant a yearly garden to offset your carbon footprint, enhance your health and decrease your food bills dramatically.
- Can your garden vegetables for a winter's supply.
- Opt for organic detergents, pesticides, herbicides, fungicides, household chemicals and food sources!

Other Sustainable Facts and Ideas for Integrating Sustainability into the Classroom and helping to reduce our doubt on campus.

- **Water - Don't Be A Drip Be Water wise**

Fact: A steady drip can waste 20 gallons of water a day (One Makes a Difference.)

Southern California's coastal plain is mostly arid with little native water to meet the needs of our large population. Water conservation and being aware of the ways in which our daily habits affect the quality of our water.

In the classroom encourage students to use less water (Turn off water while soaping hands, reduce the water flow; avoid dumping hazardous materials down the sink.)

- **Waste Reduction - There Is No Such Thing As Away.**

Fact: Californians create 46 million tons of trash a year, enough to fill 2 freeway lanes 100 feet deep from Mexican to Oregon border. (CA Integrated Waste Management Board.)

Fact: 6.8 million tons of office paper has been wasted throughout offices in the country since 1994. **Fact:** Americans use an estimated 2.5 million plastic bottles every hour.

In the classroom encourage students to use the recycling bins, and to bring recyclable coffee mugs for use at cafeteria or other coffee shops.

In the classroom post syllabus online and encourage students to email assignments, instead of printing them.

In the classroom encourage students do not buy water in plastic bottles, but to bring their own in a suitable stainless steel or Nalgene water bottle.

- **Be Energy Wise**

Fact: Five percent of all electricity in the United States is wasted powering devices not in use. (Switched) Save money! Unplug "vampire" energy users such as small appliances and chargers. Think about how much energy is wasted on campus. Turn off your computer, monitor, and printer at the end of the day. Even when the computer is in standby or hibernation mode, it is using energy.) When you leave the classroom, office, or restrooms, turn off the lights.

In the class encourage students to implement the above recommendations. Create an assignment to look at their habits concerning energy and to provide ideas for how to cut their energy use.

- **Transportation - Tread Lightly On The Planet**

Fact: If each commuter car carries one more passenger, an estimated 600,000 gallons of gasoline will be saved.

In the class encourage students to Carpool, bike, or take advantage of the Metro Transit for \$15.00 at the LAVC Business Office (818) 947-2318.

http://www.metro.net/riding_metro/ridersguide/paying_fare-06.htm

- **Be A Green Shopper - Your Purchasing Power Can Create Social Change**

Fact: In the US, waste from cattle, chickens, and hogs has polluted 35,000 miles of rivers in 32 states and contaminated groundwater in 17 states. (EPA) Eat less meat, buy local, and buy products that have recycled content such as paper, compostable plates, cups, cutlery and plastics. Stores such as Trader Joes, Office Max, and Whole Foods carry these types of products.

In the class encourage students to measure their carbon food print at www.eatlowcarbon.org.

Faculty Resources

- [LAVC www.lavc.edu/gogreen](http://www.lavc.edu/gogreen)
- [LAVC www.lavc.edu/revitalizingvalleybuildinggreen.html](http://www.lavc.edu/revitalizingvalleybuildinggreen.html)
- [LACCD District: http://gogreen.laccd.edu/useful_sites.htm](http://www.lavc.edu/revitalizingvalleybuildinggreen.html)
- [UCLA Sustainability: www.sustain.ucla.edu/about/links.asp](http://www.sustain.ucla.edu/about/links.asp)
- <http://www.epa.gov/climatechange/emissions/index.html> (EPA)
- <http://science.nationalgeographic.com/science/environment/environmental-threats/deforestation-overview.html> (National Geographic)
- <http://www.defra.gov.uk/> (DEFRA)
- <http://www.metoffice.gov.uk/research/hadleycentre/>
- <http://www.wri.org/climate/>
- http://en.wikipedia.org/wiki/Carbon_footprint
- <http://www.supergreenme.com/go-green-environment-eco:Carbon-Footprints-101-What-is-it-and-how-to-Reduce-Yours>

References

- <http://data.giss.nasa.gov/csci/>
- <http://www.ncdc.noaa.gov/oa/ncdc.html>
- <http://www.ipcc.ch/>

- www.nature.org/initiatives/climatechange/calculator/

- [www.carbonfootprint](http://www.carbonfootprint.com)