

# Understanding the GREENHOUSE EFFECT

Gases that trap heat in the atmosphere are often called "greenhouse" gases. Some greenhouse gases – such as carbon dioxide – occur naturally and are emitted to the atmosphere through natural processes and human activities. Other greenhouse gases – e.g. fluorinated gases – are created and emitted solely through human activities. The principal greenhouse gases that enter the atmosphere because of human activities are:

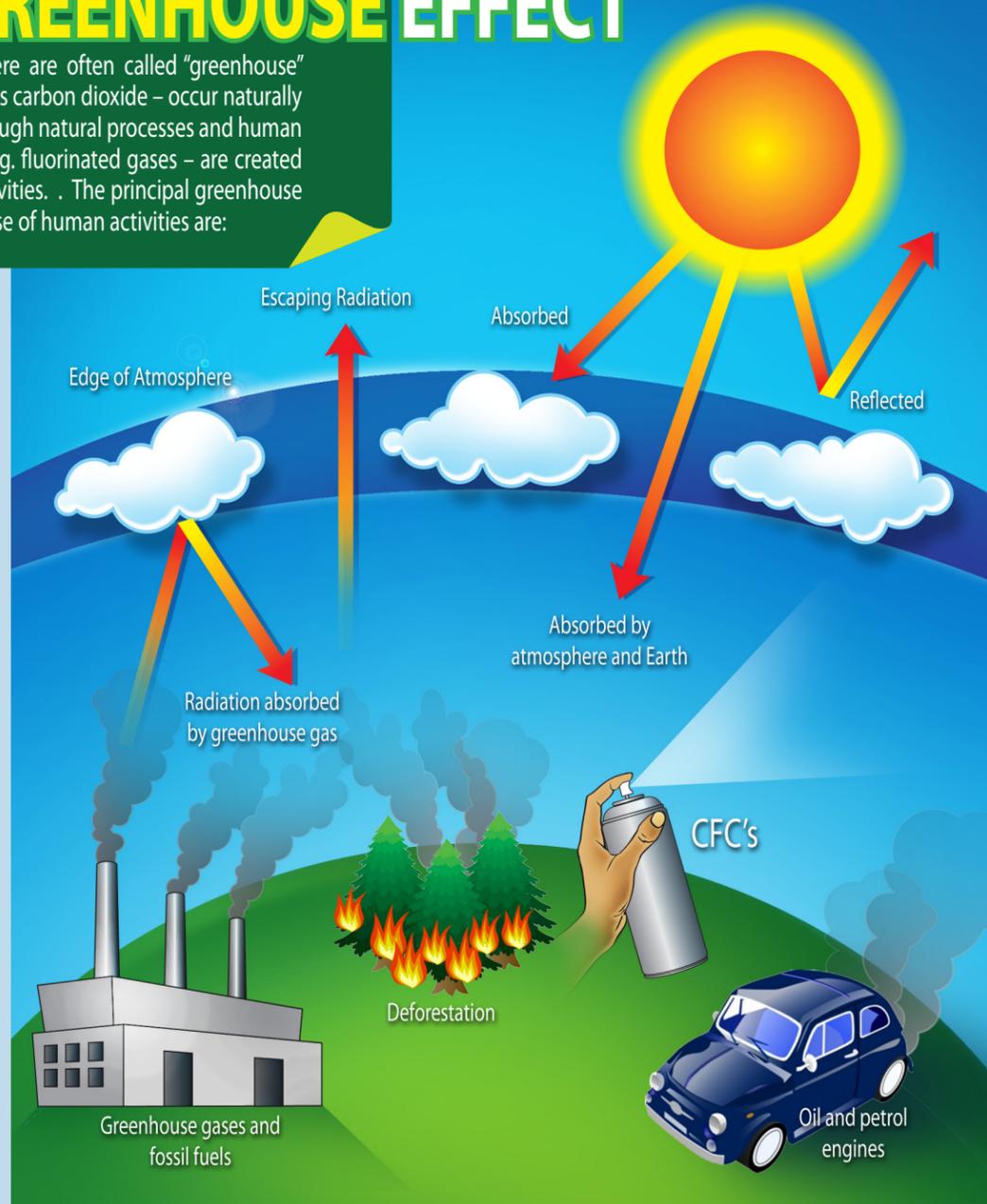
**Carbon Dioxide (CO<sub>2</sub>):** Carbon dioxide enters the atmosphere through the burning of fossil fuels (oil, natural gas, and coal), solid waste, trees and wood products, and also as a result of other chemical reactions (e.g., manufacture of cement). Carbon dioxide is also removed from the atmosphere (or "sequestered") when it is absorbed by plants as part of the biological carbon cycle.

**Methane (CH<sub>4</sub>):** Methane is emitted during the production and transport of coal, natural gas, and oil. Methane emissions also result from livestock and other agricultural practices and by the decay of organic waste in municipal solid waste landfills.

**Nitrous Oxide (N<sub>2</sub>O):** Nitrous oxide is emitted during agricultural and industrial activities, as well as during combustion of fossil fuels and solid waste.

**Fluorinated Gases:** Hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride are synthetic, powerful greenhouse gases that are emitted from a variety of industrial processes. Fluorinated gases are sometimes used as substitutes for ozone-depleting substances (i.e., CFCs, HCFCs, and halons). These gases are typically emitted in smaller quantities, but because they are potent greenhouse gases, they are sometimes referred to as High Global Warming Potential gases.

Greenhouse gases trap the heat brought by light passing through the atmosphere of the Earth. Although Earth would be a chilly place without the greenhouse effect, producing too much of these gases is having the reverse effect, hence the term "global warming" – the increase in the



average temperature of the Earth's near-surface air and oceans in recent decades and its projected continuation. Statistical data shows that the Earth's atmosphere has already warmed by an alarming 1.5 degrees Fahrenheit since the year 1900.

Scientists blame global warming for the negative impacts on sensitive ecosystems and for extreme weather conditions around the world. Solutions for this dilemma include:

- Reducing the emission of harmful greenhouse gases

- Reducing environmental pollutants
- Reducing harmful drilling and mining of fossil fuels (coal, oil and gas)
- Encouraging renewable energy (wind, solar, geothermal and biomass energy)
- Promoting cleaner transportation
- Stopping deforestation
- Promoting healthy forests and farms
- Protecting wildlife and habitat

**We can each contribute to the solution by monitoring and reducing our Carbon Footprint.**



# How large is Your Carbon Footprint?

A carbon footprint is defined as the total amount of greenhouse gases produced to directly and indirectly support human activities in a given time frame. The Carbon Footprint value is usually expressed in equivalent tons of carbon dioxide or CO<sub>2</sub>. Note: carbon dioxide accounts for only half of the world's greenhouse gas emissions.

For instance, some familiar everyday activities that produce large amounts of CO<sub>2</sub> include:

## Generating and Consuming Electricity

- Electrical power plant operations
- Operating your computer
- Having your television on
- Using your electric clothes washer, dryer and iron
- Using a water heater and/or electric dishwasher
- Using air-conditioning units
- Using a refrigerator / freezer
- Using a microwave or electric oven

## Transportation (Burns Fuels)

- Driving a vehicle
- Travelling by public transportation (taxi, bus or ferry-boat)
- Travelling by aeroplane

## Industrial Processes

Factories consume large amounts of electricity, water, oil and fuels, minerals and chemicals in the production of various goods for the consumer

## Meal Preparation

- Cooking by electrical or gas range
- Cooking by barbecue grill

## Deforestation

Forest or Bush Fires - burning releases the carbons that are normally sequestered in the trees.

## Discarding Trash

Landfills comprise of layers of commingled waste that produce methane as it decomposes. Waste can best be treated and disposed of properly if separated by category, such as:

- Product packaging such as cardboard, plastics, glass, aluminum
- Yard waste
- Food waste
- Newspapers
- Bio-medical and chemical waste
- Used furniture and appliances
- Used tyres
- Derelict vehicles



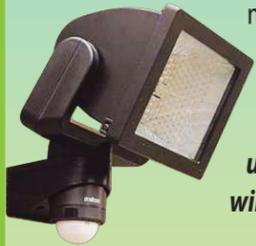
## Tips & Strategies you can use at Home to

# Reduce Waste, Save Energy Protect Your environment

## Energy Savers



Switch from incandescent to compact fluorescent light bulbs. CFLs use about 75% less energy, emit less heat, and last much longer than our normal light bulbs. They may cost more initially but save you money in the long run.



**Where possible, use timers or motion detectors on outside lights used for security lighting. The light will come on only when necessary.**

When buying appliances, look for the yellow Energy Guide Label and buy the most energy efficient appliances. If your kitchen and laundry appliances are more than 10 years old, you're spending a lot more on energy than you need to.



**Dry clothes outdoors whenever possible. If you must use an electric dryer, ensure that the lint screen is clean and avoid over or under-loading.**

*Do all your weekly ironing at one time, preferably while clothing is still damp.*



Switch off or unplug your TV, Computer, DVD, Radio and cell phone chargers when not in use. Appliances in the "stand-by" mode can use as much as

10% to 40% of the electricity that they would use when fully operational.

**If you must use air-conditioning** at home, cool only rooms that are in use and switch off if the room is going to be empty for 10 minutes or more. Service your a/c units regularly to keep them running efficiently

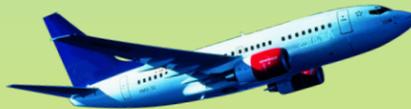


Use your water heater only for showers and use cold water for washing clothes and dishes. Switch to a tankless water heater when possible, it quickly heats water on demand and is more economical.

**Keep your vehicle in good working condition. But try more eco-friendly modes of transport when possible, like walking, cycling or telecommuting.**



**If you need to travel by airplane, try taking a direct flight when at all possible. This is not only more eco-friendly but also makes for a happier experience.**



## Shopping

Carry a reusable shopping bag with you to the market or grocery – this reduces the need for plastic or paper bags. Also, wherever possible buy goods that require either no or very little packaging.

**Bottled water** has a huge carbon footprint – it's bottled at one location in small plastic bottles and shipped all over. Only a few of the millions produced worldwide are recyclable. Use a reusable water bottle or canteen for your water.



Every item in a store has a footprint – that is, resources were spent in its production. Curb your urge to spend by window shopping or browsing first. This way you will buy only the things you really need or want.

## Conserve Water

Install low flow toilets and shower heads and switch off water while brushing your teeth, shampooing or soaping your skin. This simple act saves the waste of several gallons of fresh water.



Save the rain water off your roof in a covered barrel and use to water your plants and garden during dry weather periods.

**A leaking faucet or shower can waste several gallons of clean water an hour.** Turn off the valve to the leak and get the problem fixed as quickly as possible!

## Reduce, Reuse & Recycle



**Reduce the amount of garbage you create.**  
**Reuse:** choose to use things that have a long shelf life, or can serve another purpose after their first use.  
**Recycle** items that can be reprocessed into the same or different products, e.g. paper, glass, aluminum, plastics.

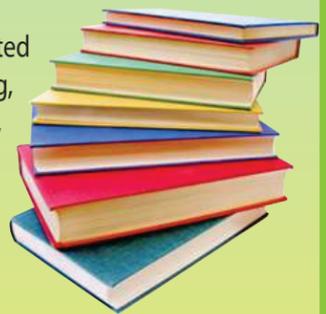
**Substitute rechargeable batteries for short-term, throw-away batteries.**



**Reuse gift wrap, bows and ribbon.** The front of greeting cards can be cut and pasted to cardstock and made into new cards or utilized in a student's craft project at school.

**Separate and save your glass, paper, cardboard, aluminum cans and plastic for recycling. This eco-friendly activity keeps valuable resources out of the landfill and reduces the cost and impacts of waste disposal.**

Buy, sell or donate unwanted or gently used clothing, shoes, books, furniture, appliances, toys, etc. Items that are still useful should not end up in the trash or landfill.



**Replace paper napkins and paper towels with cloth napkins and towels.**

**Start a compost heap** in your backyard or neighborhood. Grass clippings, uncooked vegetable and fruit peelings, egg-shells, etc. can all be added to make a nutrient-rich soil additive for your plants.



**Use both sides of the paper** when writing, printing or copying. Shred or save discarded paper for recycling.

**Throwing a small party?** Use reusable glasses, cutlery and dishes and avoid sending non-biodegradable waste to the landfill.

## Protecting Your Environment

Do not start fires in your backyard or community. Fires can not only be dangerous but can destroy valuable trees and vegetation.

**Plant at least one tree a year and be sure to do so for every tree you cut down. Trees play a vital role in storing carbons that are harmful to the atmosphere.**



SWMCOL's Public Education Campaign  
to promote Environmental Awareness and Participation

**reSolve** to reduce your carbon footprint  
and stop global warming!