

# The GLOBAL COOLING™ Answer Book

Second Edition



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We hope you will tell friends family and colleagues about TREES FOR THE FUTURE. The program is growing fast and we always need new members.

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Businesses, governments and individuals are encouraged to register their Global Cooling™ actions with TREES FOR THE FUTURE and to describe their efforts to reverse global warming.



# The Global Cooling™ Answer Book

## Second Edition

*featuring:*

A Global Cooling™ Action  
Plan for Better Living  
and for  
Saving Our Planet

How planting trees on devastated lands in  
tropical developing countries  
can save our planet from the  
Greenhouse Effect

Produced by the staff of **TREES FOR THE FUTURE**  
**Dave Deppner, John Leary, Karin Vermilye,**  
and senior advisor **Steve McCrea**

## Table of Contents

<b>Preface: Why Global Cooling™?</b>	<b>p.iii-iv</b>
<b>Introduction: Some Straight Talk About Climate Change</b>	<b>p.1-4</b>
Our Qualifications To Speak Out - Global Warming Is Really Happening - Atmospheric Levels of GHG's Can Be Brought Down - Doing More - Still, It's Time To Do Much More	
<b>Chapter I: What is Global Cooling?</b>	<b>p.5-6</b>
Why it Happens - The Importance of the World's Forests	
<b>Chap. II: If You're Not Worried, You're Not Paying Attention</b>	<b>p.7-9</b>
What's so bad about putting more carbon dioxide in the atmosphere? How do you weight carbon dioxide - What might happen if the global temperature rises two or more degrees - What can we do to prevent global warming? - Five-step action plan - Why don't we wait for Governments - What just one person can do	
<b>Chapter III: Introducing the Five Step Action Plan</b>	<b>p.10</b>
<b>Chapter IV: Step 1 - Use Fossil Fuels More Efficiently</b>	<b>p.11-14</b>
How much CO <sub>2</sub> does a US Citizen Generate Every Year? - Won't Energy Efficiency Save Us? - Solutions that will Improve Energy Efficiency in Your Home - Seven (7) Solutions that will Improve Energy Efficiency in Your Home by more than 55% - Fuel Efficient Stoves for the Developing World	
<b>Chapter V: Step 2 - Switch to Renewable Energy</b>	<b>p.15-16</b>
Are renewables the answer? - Three (3) renewable solutions for your home	
<b>Chapter VI: Steps 3 &amp; 4</b>	<b>p.17-18</b>
Protect old-growth and new forests as "warehouses for carbon" & Harvest forests in a sustainable manner	
<b>Pictures</b>	<b>p.19-22</b>
<b>Chapter VII: Step 5 - Planting Billions of Trees</b>	<b>p.23-26</b>
The Loss of Biodiversity - What are Super Trees?	
<b>Chapter VIII: Why Projects Succeed and So Many Fail</b>	<b>p.27-31</b>
Characteristics of our projects - What About Project Costs?	
<b>Ch. IX: How Anyone Can Make a Global Cooling™ Home</b>	<b>p.32-33</b>
<b>Ch. X: How To Make a Global Cooling™ Business</b>	<b>p.34-35</b>
Trade Association - Magazines - Coffee Industry - Five Ways to Create a Planet-Saving Office	
<b>Chapter XI: What Industries Can Do</b>	<b>p.36-37</b>
Automobiles - Travel, Airlines & Other Businesses - How Cities Can Offset Electricity Use	
<b>Chapt. XII: What Students Can Do to Cool the Planet</b>	<b>p.38-39</b>
How your school room can become "Global Cooling™ - Tree Pals	
<b>History of How TREES Started the Global Cooling</b>	<b>p.40-41</b>
<b>What Is TREES FOR THE FUTURE?</b>	<b>p.42-43</b>

## Preface: WHY GLOBAL COOLING™?

Global climate change, which the world is increasingly experiencing, is often called "Global Warming". The reason is that for over 150 years, average temperatures on earth have been slowly increasing.

For the most part, this has been the result of human activity. It is often blamed on major energy users: the "polluters of the atmosphere". In turn, they have spent vast sums of money, first to deny that it is happening, then to say that none of this can be proven and that those who suggest it can are using "bad science". They add confusion by substituting weather for climate, trying to de-bunk the issue: for example, on a bitterly cold morning in Chicago, they might ask "so this is your global warming?"

None of these arguments worked, so they took a new approach, saying that even if there is such a thing as global warming, there's really nothing we can do about it. Some even suggested it might bring real benefits: our air conditioning bills might go up but think how much we'd save on heating bills. Just think of oranges growing around Chesapeake Bay. The growing season for American farmers will get longer anyways, therefor helping, not hurting Americas farmers.

Still, most people are not buying this, so the big energy users took another track: even if global warming happens, any attempt to stop it would drastically raise taxes, cost millions of jobs, and wreck the economy. In other words, we should just lay back and accept it.

Our own experience proves all this to be a great lie. Over more than 30 years, we've been working and living in the developing countries of the tropics where climate change is far advanced. We've seen the effects of climate change taking place. We've seen the dry seasons getting longer and hotter.

We've seen storms growing in frequency and violence. We've seen floods where they had never been before. And rivers becoming salty even though they are far from the sea. We've seen islands disappear and new diseases arrive. Like the people of these lands, we know the climate is changing right before our eyes - and the change is moving quickly to the world's more temperate lands.

Through all these years, we've also found that projects for the benefit of the environment, if planned correctly, don't cost: they pay! They don't take away jobs. Instead they offer new sources of sustainable income. They start whole new industries. These new jobs are in managing, rather than exploiting, the world's natural resources. Instead of

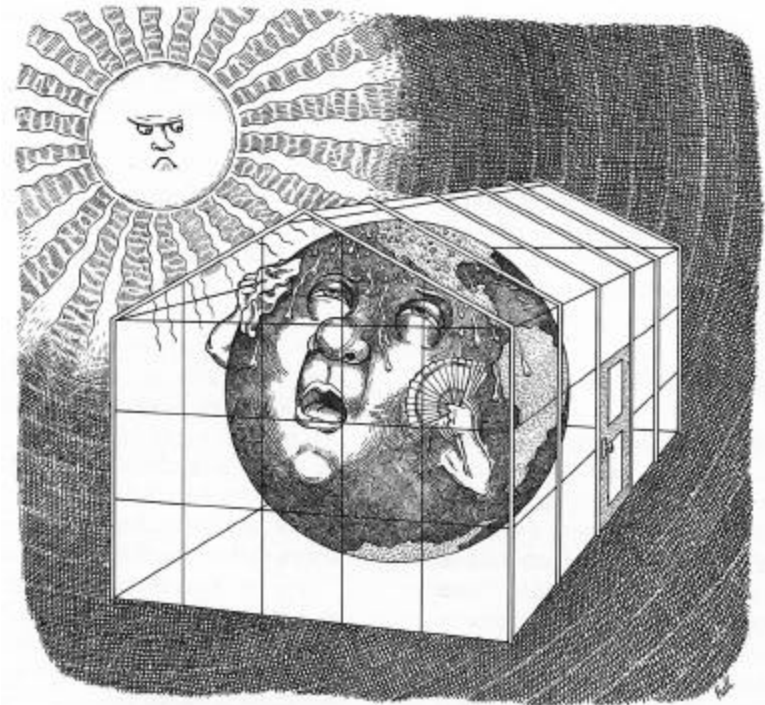
raising taxes, such projects actually reduce the expenses of governments. Many such projects are especially welcome in places where governments have never been able to provide more than lip service - and where people especially need livelihood opportunities.

These projects help people around the world - and the environment we all share.

Because of the multi-million dollar ad campaigns of the major producers of carbon dioxide, the words global warming have come to mean lies, exploitation, and defeatism. All major efforts in the US to combat climate change politically have stopped while many other governments of developing countries are at least acknowledging the problem.

That's why we call our efforts GLOBAL COOLING™. It means turning this lemon into lemonade. It means recognizing that we - all of us - have a stake in this. That there are practical, affordable answers and that we owe it to our children to find and use them in a way that gives all of us - and the environment - a future with hope.

That's why we started the GLOBAL COOLING™ ACTION CENTER.  
-The Staff



## Introduction: SOME STRAIGHT TALK ABOUT CLIMATE CHANGE

### Our Qualifications To Speak Out:

For more than 30 years, the staff of TREES FOR THE FUTURE has been helping people plant trees, then forests, that bring participants important economic and social benefits. Through our program, whole communities are working together to save the world's most degraded lands. The many benefits these fast-growing trees bring allow the participating families to save their homes and way of life.

The benefits from these trees spread far beyond these remote villages, to our own homes, schools and communities as well. That's because these trees also remove from the global atmosphere great quantities of carbon dioxide, the major "greenhouse gas" (GHG) responsible for global climate change. This program takes this carbon and turns it into things people need such as food, clothing, shelter, medicines, organic fertilizer and humus - in doing so returning the carbon to the soil.

Our program has helped people plant nearly 40 million trees. Every year, these trees remove and sequester more than a million tons of carbon dioxide from the global atmosphere, replacing it with life-giving oxygen. As the evidence of global warming becomes ever more obvious, we believe our program proves that the great threat of global warming can also be turned away - if enough of us, here and in the world's developing communities, can work together for our common future. For that reason, we are here providing answers to questions that we are commonly asked about global warming. Because the threat is real - and imminent, we seek your ideas as well.

### Global Warming Is Really Happening

Virtually the entire scientific community agrees that it is real, that it is taking place right now, and that it is caused by human activity, especially the constantly increasing use of fossil fuels and increasing levels of CO<sub>2</sub> in the atmosphere (see Figure 1). Over the past century, this has raised the average temperature on earth by about 1.3 degrees F (see Figure 3). These increasing levels of CO<sub>2</sub> and other GHG's have indeed magnified the Greenhouse Effect (see Figure 4).

Even this small increase is already causing significant natural changes. Rapid melting of the polar ice caps is readily seen causing the seas to rise, and unknown to many people, these slight, yet quick increases in average water temperature are killing coral reefs through-

out the world through a process called bleaching - the increasing temperatures of ocean waters makes coral whiten before they die. Scientists are also convinced the rise in temperatures will result in at least eight (8) hurricanes in the season now starting.

Rising average temperatures and sea levels are also a reality for most countries, including our own. The Chesapeake Bay and the Mississippi Delta both lose a number of islands every year to rising water levels. Countries like Bangladesh and Tuvalu are losing most of their coastline and low lying lands, forcing Tuvalu to sign a treaty with New Zealand so its population has somewhere to go when the water levels submerge their island nation.

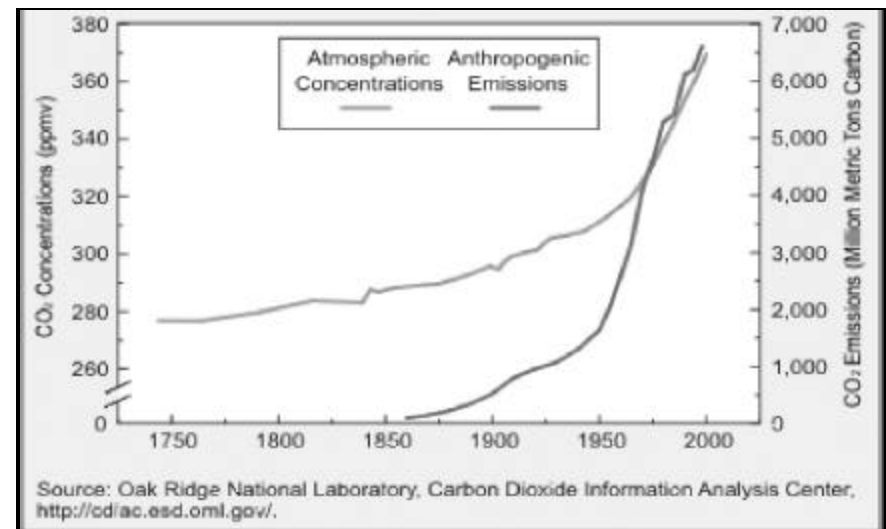


Figure 1: The life-threatening rate at which atmospheric carbon-dioxide emissions have increased over the past 50 years continues.

### Atmospheric Levels of GHG's Can Be Brought Down

Through a natural process called photosynthesis (see Figure 2), which is the process by which plants remove carbon dioxide from the atmosphere for plant growth, and by which the plants give off oxygen to replace the CO<sub>2</sub>, atmospheric levels of CO<sub>2</sub> can be brought down. In this way, nature has always been able to maintain a reasonable balance between plant and animal populations. At least until recently. Over about the last 120 years, the use of fossil fuels has increased many times over. Introducing all this formerly-stored carbon into the atmosphere, with no corresponding mechanism to take it back out, has resulted in high levels of CO<sub>2</sub> in the atmosphere.

Together with this, the world is experiencing the destruction of an area of forest as large as New England every year. Where these forests once sequestered many billions of tons of CO<sub>2</sub>, the accompanying burning has released much of this carbon back into the atmosphere, while these lands are rapidly becoming deserts. This is one of the important reasons TREES FOR THE FUTURE helps

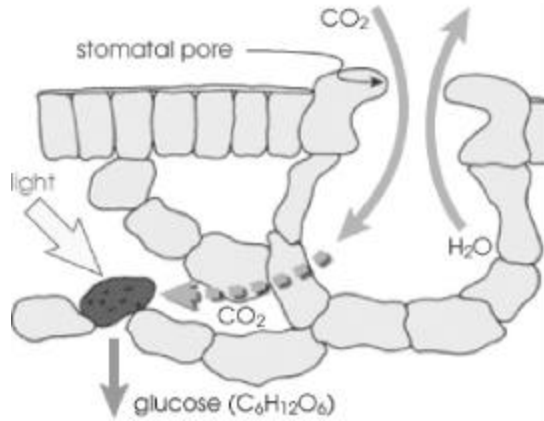


Figure 2: Through photosynthesis, one tree planted in the developing tropics can remove 50 lbs. of CO<sub>2</sub> from the global atmosphere. [www.nasa.gov](http://www.nasa.gov)

people bring tree cover and forests back to these devastated lands.

Importantly, it is the places where TREES FOR THE FUTURE is working the tropics and sub-tropics of the developing world, where tree planting, reforestation, and sustainable land management best maximize levels of photosynthesis. We work in the photosynthetic hotbeds of the world: the tropics and subtropics. Trees planted in these areas sequester carbon three times faster than trees planted in temperate regions.

### We Should Be Doing More

It's our future too. The USA is an industrial giant and also enjoys one of the highest standards of living in the world. Americans are polluting the atmosphere at a rate four times higher than the average person on earth. It follows that, since we are the leaders in making this mess, we should also be leading the way in cleaning it up.

And yet, as we write this book, we have seen our Congress end a debate about setting emission limits by taking no action. The USA has gone through three administrations that have spoken words of concern and made promises about global warming - and have done nothing.

Realistically, reducing emissions will not, by itself, address this threat. But it's one small step in the right direction - and we couldn't even do that! Our government knows this. The signatories of the Kyoto Treaty know this. They know that atmospheric levels of CO<sub>2</sub> and other greenhouse gases are already far too high.



The work to save our planet from global warming is taking place in the world's most remote villages, such as Musikot, Nepal, shown here, where our technicians assist people to plant trees that can save their lands and way of life.

Recent surveys indicate that the majority of Americans understand and are greatly concerned about the issue. They are starting to make their voices heard in the market place, increasingly patronizing businesses that share their concern and join them in reducing the threat.

The American economy very much depends on international trade, with trading partners in Europe and elsewhere who are committed to the Kyoto protocol. These partners are beginning to ask why they should continue to trade with businesses in the United States who are making no effort to reduce these GHG emissions.

In response to these pressures, some US-based businesses have begun showing concern, supporting projects that address issues of climate change and destruction of the world's forests.

### Still, It's Time To Do Much More

We can't help ourselves just by doing less harm - we also need to do more good. Does this mean raising taxes? Closing factories? Wrecking our economy? No--just the opposite. It means growing our economy in new ways: developing sustainable energy sources. Much more important, restoring and managing the world's natural resources, literally turning the deserts back into sustainably managed forests. This is all possible. The people of thousands of communities we assist, all over the world, are proving this. They're proving that sustainable resource use is a wise investment in the future of every one on earth.

We invite you to read farther. See what determined people, some in faraway villages, some of them your neighbors, are already accomplishing by working together to save the environment all of us share.

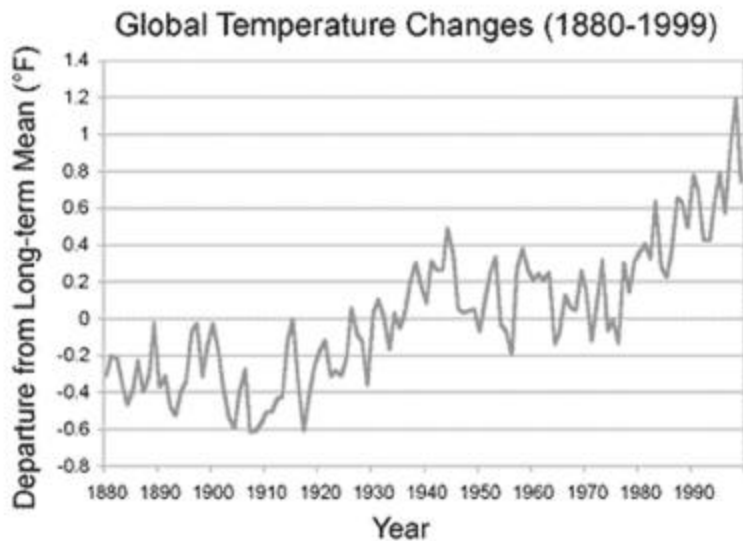
## Chapter I: WHAT IS GLOBAL COOLING?

The earth is heating up. This has happened time and again over the millennia: the earth first warming, then cooling. Each cycle took place over many centuries.

Then, starting in the early years of the 19th Century, and continuing even now, the warming has gone on at an extremely rapid pace. The change began to accelerate around the time that the Industrial Revolution started. As industries grew, and the use of coal, then gas, then oil, increased, so did levels of carbon in the global atmosphere. And so did the rate of global warming.

Study of the earth's average temperatures and climate is a fairly recent science but as temperatures at various locations around the world began to be recorded, it became possible to determine the earth's average temperature. In that way, it was determined that over the last approximately 120 years, more or less the time when the use of fossil fuels rapidly increased, that average temperature has increased by about 1.3 degrees F (see Figure 3).

It has further been determined that the rate of increase is accelerating and that over this new century, the average temperature will increase by about two (2) additional degrees Centigrade.



Source: National Climatic Data Center, 2000. Climate of 1999 - Annual Review.  
Online at <http://www.ncdc.noaa.gov/climate/research/1999/ann/ann99.html>

Figure 3: Average global temperatures are increasing so fast that flora and fauna throughout the world cannot adapt quickly enough.

## Why it Happens

Much of the reason is the increased use of coal, gas and oil. Like wood and other organic fuels, these "fossil" fuels are composed mostly of carbon which, when burned, unites with oxygen and forms carbon dioxide (CO<sub>2</sub>). This causes at least 55% of the greenhouse effect both by allowing celestial heat to enter our atmosphere and by blocking much of this accumulated heat from escaping (see Figure 4).

Organic fuels, such as wood, when burned, also put CO<sub>2</sub> into the air but, as new trees grow, through photosynthesis they absorb the CO<sub>2</sub> and remove an equivalent amount from the atmosphere and are, therefore, considered "environmentally friendly".

Fossil fuels, on the other hand, bring carbon that has been buried deep in the earth for millions of years. Burning it also unites it with oxygen and emits it as CO<sub>2</sub> into the atmosphere. The problem is that there is no corresponding increase in vegetation to remove it through photosynthesis.

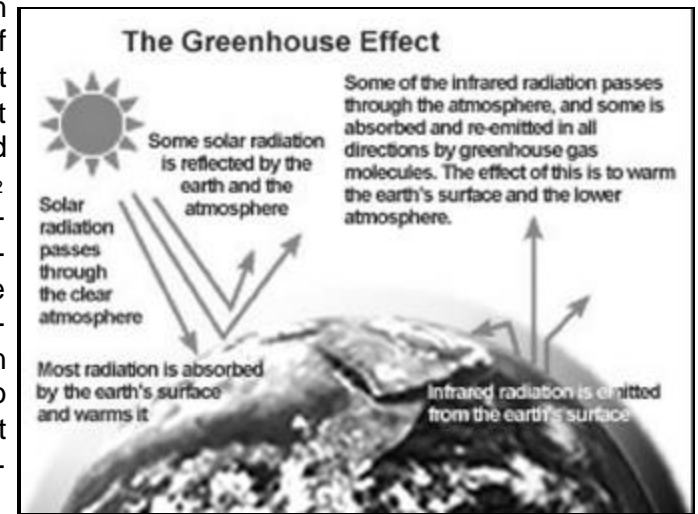


Figure 4: Current levels of CO<sub>2</sub> continue to trap heat in the earth's atmosphere everyday via the Greenhouse Effect.  
[www.epa.gov](http://www.epa.gov)

## The Importance of the World's Forests

The increased use of fossil fuels is only one part of the threat. With it, the earth is losing its forests. These might be considered as giant warehouses for carbon. But more than 42 million acres of the world's forests, an area the size of New England, is cleared each year. In the process, the land is burned over and this carbon also enters the atmosphere - more carbon but less trees to remove it.

## Chapter II: IF YOU'RE NOT WORRIED THEN YOU'RE NOT PAYING ATTENTION

The US economy generates **1.33 billion tons of carbon**, or roughly 20 tons of carbon dioxide for every man, woman and child in the U.S.

**Q: What's so bad about putting more carbon dioxide in the atmosphere?**

Carbon dioxide (CO<sub>2</sub>) causes at least 55% of the greenhouse effect, trapping the sun's heat in the atmosphere. Rising temperatures around the world are melting polar ice, raising sea levels, increasing the temperature of oceans and generating more frequent and powerful storms and hurricanes, so conclude experts who study climatic change.

A warmer world will turn the subtropics into tropics and tropical diseases, including those that have no vaccines, will move north. If global warming remains unchecked, insects carrying dengue fever and malaria will soon begin infecting human populations in new areas such as Florida and Texas.

You've heard that using fossil fuels (coal, natural gas, propane, diesel, and gasoline) is a major cause of global warming. You've heard that each of us should become more energy efficient and that we should switch to renewable energy sources like solar power and wind energy, and that we should use electric cars, take the bus, or ride in car pools instead of driving alone to work.

However, even if you become three or four times as energy-efficient as you are now, you still will be generating carbon dioxide through your demand for transportation and power. If you live in an industrial society, you are contributing a large amount of CO<sub>2</sub> to the greenhouse effect and the gradual increase in average global temperatures. The next time you eat a salad, think of the energy used to transport and cool the lettuce, carrots, tomatoes and radishes on your plate.

### A Question Frequently Asked: HOW DO YOU WEIGH CARBON DIOXIDE?

**Reply: You can't use a bathroom scale.**

Most people find it surprising that a gallon of gasoline turns into 20 pounds of carbon dioxide. Here's the calculation: One gallon of gasoline weighs between 5.8 and 6.5 lbs.. Gasoline contains carbon, with an atomic mass of 12 units, and hydrogen, mass one (1) unit. Carbon dioxide adds two oxygen molecules, each with a mass of 16 units so the atomic weight of carbon dioxide is 44 (12+16+16 = 44). You are

adding two units of oxygen to each unit of carbon when you burn gasoline. So a gallon (6 lbs..) of gasoline  $\times 44/13 = 20.4$  lbs.. of CO<sub>2</sub> plus water vapor, if burned completely.

**Q. What might happen if the global temperature rises two or more degrees Centigrade?**

**A.** There are endless answers:

> **Coral reefs**, which feed both humans and larger fish populations, will further perish because of their inability to quickly adapt.

> In 1995, 200 million people were afflicted with **Malaria**.

Five to ten million people die each year from the disease. Malaria will spread to regions where temperatures are currently a limiting factor.

> **Elephantiasis** currently afflicts 400 million people and will likely spread further.

> No vaccine exists for **dengue fever** and **sleeping sickness**, which are spread by insect bites. Subtropical areas like Texas and Florida will become tropical, and tropical insects will follow.

> **Hurricanes**: A simple relationship exists: the higher the ocean and air temperatures, the higher the velocity of hurricane winds. In 1995 we predicted that with slight increases in temperatures, hurricanes would also start earlier: As we write this book, we see on the news that this year has the highest number of early hurricanes and tropical depressions. Hurricane season will eventually lengthen from June-November to April-December.

> **Sea Level**: A warmer planet causes the water temperature to rise. Water expands as it warms. In this way, a two degree C. rise could raise sea levels four to six inches. That's only the beginning. Global warming is melting the polar ice packs. Some greenhouse projections predict a 20 foot rise in sea levels--largely due to melted ice.

> Building **dikes** wouldn't help. Most coastlines are made up of porous limestone rock. A higher sea level will put pressure on the underground **water supply** making nearby wells too salty for use. A map depicting Florida 100,000 years ago (when the temperature was 4 degrees C. warmer) shows water covering all the land south of Lake Okeechobee.



**Q. What can we do to prevent global warming?**

**A.** The remedies of the Global Cooling Action Center to reduce impact on the atmosphere are straightforward:

- > Stop putting more CO<sub>2</sub> in the air - and
- > Remove and store what is already there

**Our five-step action plan goes like this (see Chapter III):**

1. Use fossil fuels more efficiently.
2. Switch to renewable fuels as quickly as possible.
3. Protect old-growth and existing forests as warehouses for carbon.
4. Harvest forests in a sustainable manner.
5. Plant trees, especially on the barren lands of developing countries in the humid tropics.

**Q. Why don't we wait for Governments to start acting on global warming? Since, through the Kyoto Treaty, governments have agreed to work together to reduce human-made emissions?**

**A.** There are several reasons: Do you care about your planet? Do you believe governments and industries will remain committed to their pledges? Do you believe governments and industries will work quickly enough to avert a disaster? For that matter, do you believe anybody is going to clean our own mess up except us?

**On the other hand, think what just one person can do:**

One person (Gandhi) committed to non-violence freed an entire nation. One person (Marco Polo) told stories of China and opened a trade route to the Orient. One person sailed across an ocean (Columbus) and discovered a whole new world.

- or -

One person planting a tree every day for two (2) years would reforest more than an acre of degraded land, bringing it back to sustained productivity, annually removing 18 tons of CO<sub>2</sub> from the global atmosphere and, in the process, becoming "carbon neutral".

- or -

One person purchasing a "Cool Car" certificate would plant enough trees that he could drive that car, year after year, without increasing the carbon in the atmosphere.

- or -

One person convincing a local business to become Global Cooling™ could bring back forests to entire communities around the world.

**Chapter III: THE GLOBAL COOLING™ PROGRAM  
INTRODUCING THE FIVE STEP ACTION PLAN**

The Global Cooling™ program is like a stool: it only works if all legs are strong. Our five-step action plan to reduce human impact on the atmosphere goes like this:

- 1. Use fossil fuels more efficiently.**
- 2. Switch to renewable fuels as quickly as possible.**
- 3. Protect old-growth and new forests as carbon warehouses.**
- 4. Harvest forests in a sustainable manner.**
- 5. Plant billions of trees, especially on the barren lands of developing countries in the humid tropics.**

There is no single solution to global warming and global climate change. We are leading the way in a holistic approach to addressing the world's environmental, and therefor atmospheric, problems. **We can't help ourselves just by doing less harm - we also need to do more good.**

The first step is to use fossil fuels more efficiently. This must be an immediate change in all of our lives, whether through our homes, driving behavior, offices, or vacations. While industries use the most fossil fuels and create the most CO<sub>2</sub>, individual consumption, especially through our cars, trucks, automobiles, and plane rides, are a close second in CO<sub>2</sub> production. The following Chapter IV explains this subject.

We don't have to wait for the entire infrastructure of North America to begin running our cars on hydrogen, warming our houses though solar, and producing our energy with wind, for us to integrate renewable energy into our daily lives. This can and should begin *yesterday*. Ways of integrating renewable energy sources into your lifestyle (Step 2) are explained in Chapter V.

Steps 3 and 4 involve the protection and sustainable management of both new and old growth forests. Old growth forests truly are warehouses for carbon, water, and the world's biodiversity. And while preserving old growth forests intact is vitally important, it is not feasible for many communities around the world, because forests are also their warehouses for food, fuelwood, medicines, and hundreds of other products. Chapter VI explains these topics.

Finally, Chapters VII and VIII explain Step 5, the primary mission of Trees for the Future: reforesting degraded lands.

## Chapter IV: STEP 1 - USE FOSSIL FUELS MORE EFFICIENTLY

### Q. How much CO<sub>2</sub> does a US Citizen Generate Every Year?

#### A. The number to remember is 20 tons.

As individuals, and collectively, we can begin by reducing our energy consumption. Raise the temperature in your house or office a few degrees in the summer. Lower it in the winter. Leave the car in the garage and walk when possible, or take public transportation. Turn off lights and TV sets when you're not using them.

There are plenty of such opportunities. If we all joined in, it would make a tremendous difference, not just in emissions but also in our pockets. It's also a great feeling to know you're doing something to make the world a better place.

Planting evergreen trees on the north side of our house as wind-breaks can greatly lower fuel bills, while planting deciduous trees on the south side to shade your home can cut back the need for air conditioning. People in warmer climates are learning how to give their homes "green roofs" that shade out the sun while producing food. Just think: if that sea of tin roofs that marks "Iron Market" in Port-au-Prince, Haiti, were now all green and producing food and flowers, how much cooler, and healthier, would that place be on a hot, sunny, afternoon?

All of these ideas, and many more, will make life more enjoyable and do much to reduce energy consumption, but they are not going to end the threat of global warming because energy needs are growing much faster than we can compensate by improving energy efficiency. By way of an example, suppose we all worked together to improve fuel efficiency for automobiles and, after ten years of effort, we made the average vehicle 10% more efficient. What a wonderful achievement! But how many additional cars came on the road over those ten years? A lot more than 10%!

### Question: Won't Energy Efficiency Save Us?

#### A straight answer. No.

That's not to say saving energy is wrong. It's more than a beginning. It helps us direct our concern for the environment. It allows us to live better - for less. It challenges us to constantly improve on the best we have. It creates new jobs and industries - and it reduces the carbon emissions entering the atmosphere from new vehicles and appliances.

That makes it the right thing to do. But it won't solve the crisis of cli-

mate change. Simple arithmetic gives you the answer: There are more people on earth now than ever before - and that number keeps climbing. All these people have a need for energy. Because a higher living standard implies a higher energy usage, most of us would prefer to use more energy.

Another way to look at it: the great majority of people live in the world's developing nations. While the USA, with about 6% of the world's population, produces almost 25% of the world's carbon emissions, the emissions of these developing countries are, in comparison, very small.

The people of these countries want the same living standards as the industrialized countries. They'd like a refrigerator, an air conditioner, a nice car.

How big is this difference? Look at it this way: If we did nothing at all, just kept sending the same emissions into the atmosphere for another dozen years, our percentage of the total would drop from about 25% to about 13%. That's how fast the number of refrigerators, air conditioners, cars and trucks is rising worldwide. Making them more efficient will never be able to keep up with that growth.

### Seven (7) Solutions that will Improve Energy Efficiency in Your Home by more than 55%.

1) One of the most important things you can do is to be sure your refrigerator (and other major appliances) have the EPA Energy Star label. Refrigerators run quite a bit, and inefficient models will cost you and the environment dearly (especially if you keep opening the door!). The number to remember is 450. As long as the label on your fridge says that it eats 450 kilowatt hours or less per year, the energy saved as compared to inefficient models will pocket you about \$100 every year in saved energy bills - as well as save plenty of CO<sub>2</sub> from entering the atmosphere. Best of all, Energy Star refrigerators are no more expensive than standard models and are available everywhere.

2) Make sure your water heater is insulated well. If not, there are many places where you can get a layer of insulation to fit around it.

**Caution:** Be sure not to block the pilot light.

3) Switch from incandescent light bulbs to energy efficient compact fluorescent light bulbs. Fluorescent light bulbs use 1/4 of the energy that standard light bulbs use. Not only will each light bulb save you \$40 in energy expenses over its lifetime, but each light bulb will keep an additional 800 pounds of CO<sub>2</sub> from entering the atmosphere.

- 4) "Americans as a nation leak enough electricity to power all of Chicago annually," reports **Mike Tidwell**, Director of the **Chesapeake Climate Action Network (CCAN)**. Powerstrips stop the leakage. Energy is lost in the small lights, appliances, and gadgets that we tend to leave running for days, weeks, and even months on end. Cable boxes, radios, nearly anything with a digital clock on it. Shutting off electricity from a powerstrip will completely eliminate this senseless loss of electricity and the CO<sub>2</sub> that is emitted because of it.
- 5) Turn the lights off when leaving the room.
- 6) On warm days, hang your clothes to dry outside. This bypasses the drying machine and not only saves a lot of electricity, but it also adds life to your clothes.
- 7) Use a push mower. There are great substitutes for electricity and gas-powered motors, and they are a great form of exercise.

NB: Much of the information in this section and some in the next chapter on **Three (3) renewable solutions for your home** has been supplied by **Mike Tidwell** (seen on the right with his wife) and the **Chesapeake Climate Action Network (CCAN)** in nearby Takoma Park, Maryland. Like many of us at Trees for the Future, Mike was a Peace Corps Volunteer in Africa many years ago and now works for the improvement of the world's environment we all share.



## Fuel Efficient Stoves for the Developing World

Trees for the Future complements its tree planting program (see Chapters VII & VIII) by training communities in the production, sale, and use of fuel-efficient stoves. Almost half the people in the world depend on wood, dung, or fibers as a source of fuel for their cooking and heating needs.

The most traditional form of cooking is done by resting the pot on three stones around an open fire. This inefficient method generates large amounts of smoke and particulates, not only allowing much of the heat to escape through the open sides, but also leading to horrible respiratory problems for women and children.

There are many different types of improved cookstoves being created and used throughout the developing world. Materials include dried mud, clay, ceramic, or metal, depending on available resources.

While designs vary, the main principle is to insulate the sides in order to maximize heat transfer. Improved cookstoves can reduce the amount of fuelwood needed from one-third to one-half.

**Some basic types of improved cookstoves include:**



**Left:** Lorena stove; **Above:** Mud stove; **Below left:** This African design has many names, including the Furno jambar; **Below right:** Ethiopian mirte stove.



Go to **[www.plant-trees.org](http://www.plant-trees.org)** to get your  
**Global Cooling Certificate** today.  
 Help plant enough trees to offset the emissions from both  
 your vehicle and your airplane travel

## Chapter V:

### STEP 2 - SWITCH TO RENEWABLE FUELS YESTERDAY

Largely in response to growing concern, there have lately been some important technical breakthroughs as well: "wind ranches" offer clean and sustainable energy. Many communities offer consumers the option of switching to them, which is a strong economic incentive to develop even more options. "Green" light bulbs, solar heat, and electricity from photovoltaic cells are growing in popularity.

The answer to reducing emissions appears obvious to everyone except the oil and gas companies: Find and develop alternatives to fossil fuels. Some suggest the answer is nuclear energy but, somehow, the folks in Nevada don't seem to want those thousands of tons of deadly nuclear waste deposited in their Yuca Mountain. Then too, there was the Davis-Besse scare in 2002, where a football-size hole nearly led to a loss of coolant worse than another horrible example, Three Mile Island. And then there was Chernobyl in Russia - all of which gave a whole new meaning to the words "human error".

**Q: Are renewables the answer?**

**A: They're a big part of the answer.**

There are plenty of workable alternatives we're barely looking at. How much sunlight lands on the United States each day? How much power is in the waves and the tides of our shores? Or the water running down our rivers. How many trees do we grow? How much waste are we trying to bury? Of all the natural energy we receive, free, every day of the year, how much are we actually using. Two percent? One percent? Probably much less.

The oil companies tell us production has already peaked. From here it will go down - as demand increases. How long until we see oil at \$100 a barrel and gasoline at \$5.00 a gallon. Not long. And we should remember that most of that money goes overseas, often to people



*Electricity from trees: a dendrothermal plant at Point Bolinaw, Philippines.*

we'd rather not get to know well.

Now suppose instead we kept all that money here at home, developing renewables/organics, growing our own energy. Think of the new industries that would be generated. Think of all the jobs, steady jobs, meaningful jobs, jobs right here at home--not shipped overseas--that such a program would generate.

Possibly one of the best things each of us could do is write a letter to Washington every day - until folks there get the idea.

TREES has been quite vocal in saying there is a great and pressing need to develop organic, renewable, sources of energy to reduce the CO<sub>2</sub> entering the global atmosphere. However, the question remains: while all these efforts will work to reduce the amount of CO<sub>2</sub> going into the atmosphere, **what should we do about removing some of what's already there - which, demonstrably, is far too much already?** The answer is to plant trees!

#### **Three (3) renewable solutions for your home**

1) Houses and buildings throughout the world are utilizing solar panels more and more. The only requirements are that you have an area, preferably on your roof, that faces in a southward direction and is not shaded by trees. Contrary to popular belief, solar panels DO continue to generate electricity on cloudy days, though the rate lessens. In most states, we no longer have to buy expensive batteries to store the electricity because power companies now have Net Metering Laws that give us the right to store extra electricity we produce on the grid until we need it.

2) Switch to some form of biomass heating. While corn burning stoves are one of the most popular methods, there are plenty of other organic fuels that can also be used. Models of corn burning stoves now available are very modern, and switching to this cleaner, renewable energy source could save you between \$200 and \$300 over the winter. **Even after factoring in the diesel used by farming equipment and the fossil fuels used in the transportation of the corn from the farm to your house, there is still an 85% reduction in the emissions of CO<sub>2</sub> as compared to heating your home with natural gas.**

3) The easiest way you can switch to renewable energy in your household or business is by calling your power company and requesting that you energy come from wind energy. In most states, power companies are offering consumers the option of purchasing their power from *green* sources.

**Chapter VI: STEPS 3 & 4**  
**PROTECT OLD-GROWTH AND NEW FORESTS AS**  
**"WAREHOUSES FOR CARBON"**  
**&**  
**HARVEST FORESTS IN A SUSTAINABLE MANNER**

Forests not only provide sources of timber, food, fodder, and other secondary forest products for people throughout the world, they are home to countless species of animals and plants. As concern for global warming rises, forests are also being valued for their role as warehouses for carbon.

The world is experiencing the destruction of an area of forest as large as New England every year. Where these forests once sequestered many billions of tons of CO<sub>2</sub>, the accompanying burning has released much of this carbon back into the atmosphere, while these lands are rapidly becoming deserts. The smoke from these burning lands adds another 12% to the emissions entering the global atmosphere. Now *there's* something we could stop that would make a big difference.

**There are several ways that old growth and new forests can be protected as Warehouses for Carbon.**

1) Know where your wood comes from. Buy sustainably harvested wood products when buying furniture, or purchasing lumber. Many furniture and "do it yourself" type stores are responding to consumer's concerns, and are starting to stock eco-friendly wood. Look for labels such as "SmartWood", accredited by the Forestry Stewardship Council (FSC). Even better, try to use reclaimed or recycled lumber whenever possible.

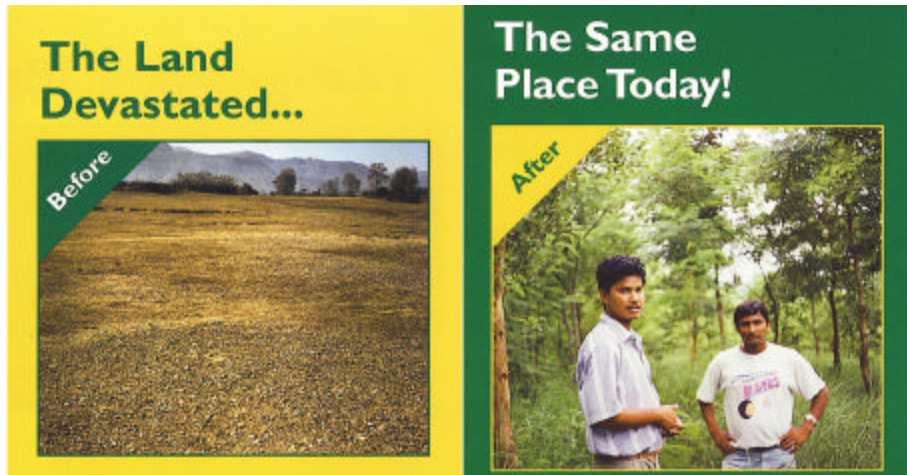
2) Use your consumer power, and tell your local stores what you want to buy. If your favorite hardware or furniture supply store does not stock eco-friendly products, ask them to. In 1999, Home Depot began to phase out its sales of old growth wood. This was because of people at the grassroots level who put pressure as consumers on the company through demonstrations and vocal and written appeals.

3) Recycle and use fewer paper products: Check your city, office, and school for recycling programs. Use less paper yourself by using post consumer recycled paper, only printing out the documents you really need, and by printing on both sides.

4) Support organizations, such as Trees for the Future, who are working with community based conservation programs that stress participatory management. **Participatory Forest Management** programs range from a consultative approach where local communities are invited to comment on conservation and management design, to community forest type projects where communities become the owners and direct managers of the forest resource. These projects involve local communities in managing the local forest and wildlife resources, and give ownership to these resources. The projects designate responsibility to the communities who often take care of the planting, monitoring, and the use of the forests. Conservation efforts throughout the world have often shown that resources are best conserved when local people gain complete ownership of the land. This has been shown time and time again with lands bordering conservation areas, wildlife refuges, and forests. Examples from throughout Africa show that people are very eager to take care of the land they often have had traditional ownership of for centuries.

**Sustainable Forest Management** relies on the practice of using timber and non-timber forest products for long term sustainability. This means that for forestry to be considered sustainable, it must take into account, not only the availability of the resource, but the social, economic, and political impacts the utilization will have on the society today and in the future. Unfortunately much of the forestry being done today is NOT sustainable, and as pressures upon the world's forests increase, wildlife and plant population habitat is being lost, and species are going extinct. Furthermore the local people, who have for so long depended upon the forest for a wide range of products, are finding themselves with clearcuts and ruined watersheds.

The blueprints for sustainable forestry exist, and every day we learn more about the importance of using the right extraction methods for specific landscapes, ensuring effective monitoring of timber companies to protect watersheds and conserve soil, maintaining landscapes to preserve intact biodiversity niches, and how vital reforestation is in Sustainable Forest Management. Everyone who uses forest resources, from the subsistence farmer in Cameroon to the major timber corporations - and including you - should be planting many times more trees than they harvest every year.



Most of the Dang Valley in Nepal has been deforested like this 65 hectare site

The same site is now sustainably producing food for 250 families and removing 1,200 tons of CO<sub>2</sub> out of the atmosphere annually.



Slash-and-burn farming and clearing forests adds 12% more carbon to the atmosphere.



Most communities know they must plant trees, but which species? Where do they get the seeds? How do they grow and plant them? Every year Trees for the Future receives hundreds of letters asking these same questions.



Women in Development: A woman in Touroua, Cameroon, uses two types of fuel-efficient stoves: a metal design (center) and a mudstove (right)



*Farmer in Cameroon hauls tree seedlings from the municipal nursery to his village.*



*The TREE PALS Program matches US schools with those in developing countries. Students learn to be environmental leaders while implementing tree planting projects and exchanging ideas and experiences with schools world-wide.*



*Kids in Bien Ho, Vietnam, showing the sustainable firewood from their project.*



*Trees for the Future's global program works through a network of hundreds of local volunteers, including Peace Corps Volunteers and local leaders world-wide*

## Chapter VII: STEP 5 - PLANTING BILLIONS OF TREES

There's one thing about wood: it's renewable and, therefore, "environmentally friendly". Although it releases carbon dioxide when burning, an equal amount of CO<sub>2</sub> was taken from the atmosphere by the tree while it was growing. It balances out.

Unhappily, the fact remains that trees are not being replaced. Wood is less and less available as an energy source. And because people need a continuing supply of energy in order to survive, they are also looking for other fuels.

That's causing a lot of problems including food and water shortages, increasing energy prices, breakdown of public transportation systems, floods and droughts: poor people have come to rely on such fuelwood substitutes as animal dung. This takes away their primary source of crop fertilizer and robs the soil of nutrients it desperately needs.

Rich people turn to kerosene, propane and electricity produced from coal or oil. That not only increases emissions but also the price of gasoline and other fuels. **If people in the USA think we have an energy crisis now, they should consider that in many developing nations gasoline is already costing more than \$5.00 a gallon.**

Looking at it the other way, restoring sustainably managed forests to the Developing World makes us a lot of friends - people who find themselves in a desperate struggle to survive, who look at eroded gullies where great forests once stood, whose children go to be hungry because they can no longer live in harmony with their natural surroundings.

As far back as the 1970's, the electric power industry was becoming concerned about CO<sub>2</sub> emissions. They commissioned a number of studies to identify ways to reduce atmospheric carbon. Several possible answers came from the studies. One suggestion was to precipitate it right at the power plant, as is done with sulfur dioxide (largely responsible for "acid rain"). Those answers proved highly impractical.

**But the studies also suggested that the most practical, most cost-effective answer was to plant trees and to restore vegetation to the world's barren lands. This is exactly what the program of TREES has been doing around the world for the past 30 years and more. In that time, we've learned a few things:**

**First**, the idea works. People living on these degraded lands suffer the effects of past deforestation and they are prepared, with our help, to make the sacrifices needed to bring back the desperately needed

tree cover and forests.

**Second**, this is best achieved in the developing countries of the humid tropics where every dollar goes about five times as far and where the trees grow three times as fast, thereby sequestering three times as much carbon.

**Third**, the world loses about 120,000 acres of forest land every day! So there is no lack of opportunity.

**Fourth**, these trees bring a great number of benefits to the people planting them. But these people don't plant trees to sequester CO<sub>2</sub>. Anybody who thinks he can plant all those billions of trees solely for their carbon-offsetting capability had better not quit his day job.

When a forest is cleared, what remains is degraded land - and degraded people. The soils erode and leach essential nutrients and the water table rapidly drops. The weather itself becomes very unpredictable. The dry season is longer, hotter, and drier. Rain is also unpredictable and destructive without trees to hold the water in the uplands.

### The Loss of Biodiversity

Restoring tree cover there is vital to the survival of the people and to their way of life. Unfortunately, most of the vegetation that was there before can't be brought back easily: there have been major changes in weather, rainfall, and soil fertility. Worst of all, the shade is gone and forest species wither under the hot, bright, sun.

Experience has taught us that the greatest immediate need is to re-create the natural conditions that were there before by returning moisture, organic matter and nutrients to the soil. By shading the land, we increase humidity and reduce daytime temperatures. More important still, we introduce trees that can quickly bring relief to the people of these communities.

### What are Super Trees?

We begin these projects by introducing "pioneer" tree species, which are called multi-purpose, fast-growing (MPFG) trees. Over the years, we've seen hundreds of such species suggested, and we've looked most of them over carefully. Of these, we found, and use under varying conditions, about twelve (12) species that can accomplish all or some of these things - without causing even greater problems than were already there! (a real consideration because we've seen plenty of disasters when people plant the wrong kind of trees).

Of these, under most conditions, *Leucaena leucocephala* has proven

the most effective and practical of the MPFG species, although we try to quickly add as many other species as we can. This *Leucaena* (pronounced Loo-Say-Na) Tree is very fast growing - in the tropics it can grow to a height of 25 feet or more in a single year. It performs well under a wide range of soil and climatic conditions. It produces at least 23 things people in villages need on a regular basis, such as fuelwood, organic fertilizer, and animal forage.

More important yet, it coppices (grows back after cutting) readily. On our farm in the Philippines we have some that have been cut at least once a year since 1976 and we never lose any. Yet at the same time, this and the other tree species we employ in this program are not invasive. Just the opposite - they have the characteristics needed to encourage the swift and natural return of much of the past diversity.

With these considerations, and seeing what's happening with so many "genetically-engineered" plants, we're not looking for any "super species". We want trees that are tough, that can take the hot sun, that can actually thrive under harsh conditions. But we don't want trees that will dominate the land. Our trees have a job, in fact several jobs, to do. One of those is to create the conditions so that seeds and living roots of the past diversity, laying dormant in the soil, often for many years, can come back to take a place in the continuously increasing diversity. These trees also encourage the return of birds and bats which also play a major role in bringing seeds from around the region.

These first trees "fire-proof" the land. They take nitrogen from the air and put it in the soils. They provide habitat for endangered birds and wildlife so that the process of regeneration takes another big step forward. They reduce daytime temperatures by about 5 degrees F. and their thin canopy offers partial shade so that forest species can return-naturally.

The roots and leaves of these trees make important contributions. Tropical soils leach nutrients quickly, such as zinc, copper, iron and many others. These trees have narrow root cones (so they don't compete with crops growing next to them). The taproots can reach 60 feet into the earth, bringing vital nutrients back into their own leaves. Then, through leaf-fall, these nutrients come back to the topsoil, providing a natural, complete, fertilizer.

One acre of these trees produces about seven tons of leaves (dry weight) in a year. Used as organic fertilizer, that's adding about 500 lbs.. of nitrogen per acre. The leaves also make a high-protein, highly palatable, animal forage, adding even more nitrogen. And these leaves

take about 17,000 lbs.. of CO<sub>2</sub> out of the global atmosphere **annually**.

Then there's the wood. The annual harvest averages about 5 cubic meters per acre. These trees provide hot, clean-burning wood, which brings premium prices in local markets in a continuing supply.

Not super trees - but they come close.

**Summary:** We are in a hurry to bring tree cover and forests back to these barren lands. The clock is moving fast on the people of these areas and to continue their way of life, they need benefits - soon.

But they, and the rest of us as well, need for these benefits to be sustainable - growing year after year. And experience has taught us that this will only happen if we work in harmony with the natural forces of the land and not try to force things with trees that are "super". **So we do our best to restore the conditions that were once there. Then, experience has shown us, if we've done our job right, natural forces will take over and do a good job from there.**



*These two pictures show the versatility of the *Leucaena* tree. (Left) Five-year-old *Leucaena* trees on our farm in the **Philippines**. (Right) Branches and leaves of this five-year-old *Leucaena* tree in **Senegal**, West Africa, are constantly being harvested as new ones re-grow.*

## Chapter VIII: WHY SOME PROJECTS SUCCEED AND WHY SO MANY FAIL

Various development agencies including USAID, FAO, the United Nations Development Program, and U.N. Environment Program have been working on reforestation projects for years. Unfortunately, a very large percentage of these projects have high failure rates, and leave local communities staring at unfinished and abandoned projects with disappointment and growing doubt that the outside world can bring them the help they need to restore their degraded lands.

Why is it that so many reforestation projects, with their scientifically designed projects plans, and generous funding from foundations, private donors, and yes -- tax payers like you, have such high failure rates? Well, we here at **Trees for the Future** have been at this a long time, and we have spent much of that time walking through farmer's fields, and sitting with them in their homes and compounds trying to figure out an answer to this question. We believe it comes down to money and respect, too much money going to the wrong places, and not enough respect for the people these projects are meant to serve.

People have lived within and near forested areas for centuries. For all those years they have maintained, depended on, the forests. It's only been in the last 60 years or so that the majority of their forests were cleared: not by them and often over their strongest protest because, to them, the forests were life itself.

Just one example of this happened in the mid-1980's as the destruction of the Indonesian rainforests continued. The Penang tribes of Borneo, men, women and children, laid down on the jungle roads in front of the trucks and bulldozers to keep the loggers out. It worked until local police arrested all of them - for "blocking traffic".

In the same way, far too often, instead of providing help to people who desperately need it, reforestation projects impose solutions that don't make sense to the people who, ultimately, will be the ones planting the trees - if they get planted at all. These are also the people who must maintain the trees year after year. If that's going to happen, these trees had better be continuously providing them with important benefits.

We learned a long time ago that you can't pay people and you can't threaten or bully them into planting trees. At the same time, there's no need to do a "selling job". The people of these communities know full well they're in a desperate situation: they either find a way to save their

lands, or they lose their homes and way of life. They're ready to listen to anybody who has a workable plan but the only way that will happen is if the consultants are willing to listen to what the community has in mind and then develop a joint plan to meet their needs, their capabilities and their expectations.

That takes time. It takes an understanding of how that community works, how it maintains itself, how people there have managed to survive and even prosper for all these years. In other words, it takes respect because, otherwise, the technicians will never listen to what they have to say.

Over the past 17 years, TREES FOR THE FUTURE has assisted more than 75,000 families, in 9,000 villages of Asia, Africa and the Americas, to plant nearly 40 million trees - each year these trees remove more than a million tons of CO<sub>2</sub> from the global atmosphere.

In that time, we have achieved an overall success rate of about 86%. That's good but it still means we have a lot more to learn and that we have to listen even more closely. All of these projects were assisted in response to a request from that community - we don't "target" places to plant trees.

The initial step in all these projects was to learn what are the needs and ideas of the community. Then each project was initiated in response to those needs--we don't use "cookie cutter" solutions.

We did, however, learn that many of these needs are surprisingly similar in various parts of the world. People tell us they need trees because:

The wells/streams are going dry.

There is a shortage of firewood.

The land is eroding and the soil productivity keeps falling.

There is a shortage of livestock forage in the dry season.

Village women need livelihood opportunities.

The dry season keeps getting hotter and they hope the trees will cool their community.

There are many other reasons but the ones listed above are almost universal. The water shortage was a lesser concern in the past but is, by far, the biggest concern now throughout the tropical world.

There have been far too many failures. Time is too short and villages throughout the developing world are dying. Failure should not be the norm. Although there are difficulties in getting very diverse societies

working together, TREES FOR THE FUTURE has shown that projects can succeed. **There are some characteristics of our projects that we believe are worth noting:**

- a) Project design is based on the perceived needs and expectations of the participating communities.
- b) Projects are only initiated at the request of the community itself.
- c) Project design must consider the specific climate, soil and terrain limitations of the community, as well as the abilities and limitations of the participants.
- d) The project is designed for the express benefit of the participants. It must begin providing these benefits within a one year period after the project is started.
- e) The project should not require the participants to spend any of their own money. Instead, they are contributing their labors and a portion of their land.
- f) The project must be easy to understand and to replicate by others in that, and nearby, communities.
- g) In addition to increasing local capabilities, the project must be designed to strengthen local institutions.
- h) The project design must address the needs of the participants in a way that also brings important benefits to the larger community (e.g. reducing the threat of flooding).
- i) The design does not look upon planting the trees as an end unto itself. Instead it should be considered the beginning of a continuing process of restoring the land and replenishing the natural resources.
- j) It must also recognize related issues such as growing populations and few outside employment opportunities.

It may be noted that these recommendations mention nothing about planning projects for their carbon-offsetting value. While we recognize that the carbon benefits are significant, that's not why people are planting the trees.

#### **Q. What About Project Costs?**

**A.** TREES FOR THE FUTURE is planting trees - permanent, beneficial trees - at a cost of less than ten cents (\$0.10) each. That's about \$60.00 per acre of degraded land restored to sustainably high productivity. That's a one-time cost of about \$4.00 to plant enough trees (40) to take a **ton** of carbon dioxide out of the air every year.

The initial cost is only part of the consideration. Just as important is the duration of the project. We believe a project must be designed to last - and expand - for more than 30 years. When we initiate a project, we believe it must be a continuing effort, requiring our continuing attention and support, so that it continues to bring the maximum benefit to that community.

We point out that the only practical way this is possible is by motivating and training local leaders and, with this, by helping them strengthen the institutions that make that community function. By far, our greatest strength is the people working at these project sites every day. The only pay these "barefoot technicians" get is in knowing they're doing something important for their people.

Ideally, with the needed support and the guidance of these community leaders, the project will continue to expand, year by year, into new communities. In other words, if we do our job right, it should cost less than thirteen cents (\$0.13) per ton of carbon sequestered. (Some organizations and agencies are recommending an annual cost of over \$500.00. It seems an easy choice).

#### **Summary:**

The people of these communities know well that they must make changes if their communities - and their own families - are to have a future. They don't need any convincing. With that, these villages have been there for a long time, often for several centuries. The people there have seen change and have learned to adapt to new conditions. With all this going for them, why is it that the technicians working for many of these reforestation projects have such a dismal record of achievement?

The answers they give are even more discouraging: "The money ran out". "The level of technology was too sophisticated for this place". "People there didn't want it". All that boils down to one thing: The planners didn't listen! They were so busy with their budgets, and their air-conditioned cars, and their fancy technology that they never found out what people wanted.

At TREES, we try to do better. The design of conservation projects must be done on the village level. The community needs to not only participate in the planting of trees, but they need to run the projects themselves for a project to be sustainable in the long term. It is the local people who must lead the reforestation projects. Finally, these projects must provide real benefits to the people involved.



TREES International Programs Coordinator John Leary delivers a training to Senegalese farmers on multi-purpose windbreaks.

*This project is successful because, from the very beginning, it was designed to maximize benefit to participating families with a technology that is easily replicated.*

Conservation designers, project technicians, and yes, we here at Trees for the Future, need to constantly be mindful of the fact that the local communities are the ones who know what they need most, and only by incorporating those needs into tree planting projects, and letting communities take the lead in those projects will the success rates rise, and abandoned projects become less common. It truly is about respect.

Go to [www.plant-trees.org](http://www.plant-trees.org) to support a tree planting project today.

You can:  
**Adopt-a-Village**  
**Plant-a-Grove**

Plant trees in honor of anyone for any reason!

or

Get a **Global Cooling Certificate**

## Chapter IX: HOW ANYONE CAN MAKE A GLOBAL COOLING™ HOME

### First answer: Build your house right.

According to the Rocky Mountain Institute in Snowmass, Colorado, it would cost about \$1,800 less to build an energy-efficient home than a conventional house because "eliminating the air-conditioning, furnace and duct work more than pays for the energy savings that make them unnecessary." Nowadays, energy efficient designs maximize sun exposure in the winter and minimize it in the summer. They utilize new advances in insulation and building materials and even solar and wind power. "Maintenance costs, expressed in lump sum in today's dollars, are \$1,900 less over the years."

The typical household with three to five occupants spends \$1,481 per year on energy. This breaks down as follows:

	\$	%	tons of CO <sub>2</sub>
Appliances	415	28	3.9
Space Heating	395	27	3.9
Air Conditioning	223	15	2.1
Water Heating	207	14	2.1
Refrigerator	142	10	1.4
Lighting	99	6	0.8
	<b>\$1,481</b>	<b>100%</b>	<b>14.2 tons</b>

In the United States, residences generate around 170 million tons of carbon each year - about 20% of total U.S. emissions. According to the Rocky Mountain Institute, the top 20 carbon generating appliances are:

Source of CO <sub>2</sub> Emissions	Pounds of CO <sub>2</sub> per year	What's in your home?
Water Heater	9858	_____
Central Air Cond.	6008	_____
Spa (Hot Tub)	4280	_____
Pool Pump	2790	_____
Refrigerator	2420	_____

Clothes Washer	2009	_____
Room Air Cond.	1990	_____
Clothes Drier	1972	_____
Water Bed	1786	_____
Dish Washer	1739	_____
Range	1562	_____
Outside Lights (2)	1358	_____
Furnace Fan	1116	_____
Aquarium	1116	_____
Car Engine Heater	930	_____
Space Heater	930	_____
Television	855	_____
Dehumidifier	744	_____
Well Pump	670	_____
Microwave Oven	409	_____
<b>Your Total of The Top Twenty</b>		_____

If you have all these appliances, you have plenty of opportunities to reduce your energy consumption...and you can also plant trees.

If you choose to plant trees, a typical house consumes about \$1,900 a year in energy costs. If this is converted entirely into electricity, this means about 19,000 kilowatt hours per year. At 1.5 pounds of CO<sub>2</sub> per kWh, that's about 28,500 pounds of carbon dioxide, or slightly less than 15 tons of carbon dioxide annually. Planting 600 trees in the tropics (about one acre) will take this much carbon dioxide out of the air every year.



## Chapter X: HOW ANYONE CAN MAKE A GLOBAL COOLING™ BUSINESS

**Answer:** Count your carbon emissions and plant trees to offset them. Here are some case studies:

**Case Study #1: The Global Cooling™ Trade Association:** The Miami River Marine Group became the first industry association in the world to become a Global Cooling™ Office, planting enough trees in Belize to offset more carbon dioxide than their staff generates each year.

The Miami River Marine Group is a coalition of enterprises dedicated to supporting the revitalization of the Miami River. Fran Bohnsack, Director of MRMG, says, "This is an ongoing commitment. Capturing carbon dioxide is just as important as reducing other forms of pollution. Just because CO<sub>2</sub> is invisible doesn't mean we can ignore it".

**Case Study #2: The Global Cooling™ Magazine:** Haut Decor International, a design trade magazine based in Miami, Florida, became the world's first publication to "cool the planet" in September, 1995. Printing and editing six issues of the magazine produces a lot of carbon dioxide. This was offset by planting trees in the Philippines.

The estimate of carbon dioxide considered a wide range of sources, including the gasoline to bring employees to work, and to distribute the publication, the electricity, the air travel, and six press runs totaling two million sheets annually.

Manuel Verdeguer, co-publisher of Haut Decor International, asks: "What harm can planting trees do? We are turning into a global economy so all businesses, big or small, will have to take responsibility for what we can do to improve life on the planet. We hope other businesses will join us in reducing the threat of a rising sea level--which is of special interest to anyone who lives in South Florida".

**Case Study #3: The Coffee Industry Joins In.**

**Thanksgiving Coffee**, a specialty coffee roaster in Ft. Bragg, California, decided to plant enough trees to offset all their emissions, from trucking materials, packing, electricity usage and, especially, the propane used for roasting. **TREES FOR THE FUTURE** made a calculation and determined it would require about 27,000 trees to offset all the carbon dioxide these activities annually produce.

Then **Paul Katzeff**, president of Thanksgiving, asked "how many trees would it take to offset the carbon emissions from perking all these millions of cups of coffee we sell each year?" That took some research with the Dept. of Energy before we came up with the answer - almost as many as to make your plant "carbon dioxide neutral". Thanksgiving then provided a grant of \$6,000, which allowed 60,000 trees to be planted in the highlands of Ethiopia, about 80 miles southwest of Addis Ababa.



*Behind oil, coffee is the most-traded commodity in the world - and the best is shade-grown!*

#### **Here are Five Ways to Create a Planet-Saving Office:**

- 1) Use less energy. Adopt a "casual dress" code, which tends to reduce dry cleaning bills for employees and cuts air-conditioning bills in the summer.
- 2) Use energy more efficiently. Gather information by contacting the "Green Lights Program" of the US Environmental Protection Agency, which also offers tips on how to use energy savings to build positive public relations and publicity.
- 3) Investigate renewable energy sources for providing energy to your office. (Here in Maryland, and in other states, consumers can order their electricity from a renewable source. Our office now gets its electricity from a wind power ranch, located in western Maryland.)
- 4) Plant trees to absorb the carbon dioxide that your office generates.
- 5) Link your business activity to rainforest restoration and tree planting programs. Your customers will appreciate it.

#### **What is meant by a Carbon Audit?**

This is a way for a business to determine the amount of carbon dioxide that it emits over a period of time. It totals the emissions from all sources that involve the use of energy from fossil fuels. We learn of concerned businesses spending a great deal of money for such audits. That need not be. TREES FOR THE FUTURE can work with you to perform such an audit. You'll be surprised how much energy your business uses in a year - and how little it will cost to make yours a Global Cooling Business™. **The Carbon Offset Worksheet is available at [www.plant-trees.org](http://www.plant-trees.org) or by emailing us at [info@treesfff.org](mailto:info@treesfff.org).**

## **Chapter XI: WHAT INDUSTRIES CAN DO TO BECOME "GLOBAL COOLING™"**

Build a link between the marketplace and emissions. The goal is to make carbon storage part of the economic activity, since the market activity is driving up carbon emissions. We need to build the link between economic growth and tree planting. Plant these trees in the developing countries of the tropical world so they bring more benefit, faster and longer, in a very cost-effective way.

#### **Example #1: Automobiles**

A gallon of gasoline when burned produces 20 lbs.. of carbon dioxide. A typical US automobile is driven about 13,000 miles in a year and produces its own weight in carbon as carbon dioxide. For an average compact car--and driver--this would be about 10,000 lbs.. - five tons - of CO<sub>2</sub> on the average.

A single tree in this program annually sequesters 50 lbs.. of CO<sub>2</sub> in a year. Then 40 trees will sequester a ton of CO<sub>2</sub>. This car produces 5 tons and so, by planting **200 trees** (40 trees x 5 tons), this car can now be driven without adding carbon dioxide to the atmosphere. In other words, it's now a "Global Cooling™ Vehicle".

TREES FOR THE FUTURE will sell you a **Global Cooling Certificate** (see Page 13 for a picture) - also known as a Cool Car Certificate - for \$40. This certificate supports the planting of **400 trees**, offsetting one vehicles' annual emissions as well as emissions of several plane trips. Purchasing this certificate is your membership to TREES for a year and gets you our quarterly newsletter and bumper-sticker. The Global Cooling Certificate will fit right in your glove compartment. It also makes a great gift for a friend. We are also encouraging gasoline retailers to plant a tree for you every time you come in for a refill. Think how many times you head into a gas station and you'll see it wouldn't take too long until you have your 200 trees planted.

#### **Example #2: Travel, Airlines & Other Businesses:**

A very significant source of carbon emissions is the burning of jet fuel--just imagine the emissions coming from all those passenger jets continuously crossing the Atlantic Ocean.

One passenger flying on a typical 250 seat passenger jet generates one pound of carbon dioxide every two miles. On a flight across the United States, about 3,000 miles, a passenger puts about 1,500 lbs. of

CO<sub>2</sub> into the atmosphere. It takes 30 trees to remove this carbon dioxide in a year (and another 30 trees to get you back home). How many such flights does this passenger take in a year?

Many "green" conferences have adopted the idea of encouraging attendees to "travel green". We provide "Trees for Travel" certificates to such conferences. For one dollar (\$1) each, we provide the attendees such certificates, each one showing that ten trees are being planted to offset the emissions from traveling to the conference.



*Clients appreciate receiving Trees for Travel certificates from travel agents, hotels, conferences, B&B's, and other businesses concerned about the environment.*

### Example #3: How Cities Can Offset Electricity Use

The CO<sub>2</sub> emissions from generating one kilowatt hour (kWh) of electricity varies between 1.3 lbs.. (natural gas) and 2.4 lbs.. (coal) - on the average across the US, it's estimated at 1.9 lbs.. of CO<sub>2</sub>, or 1900 lbs.. of carbon dioxide, per thousand kWh of electricity. Using our program, planting 38 trees on barren lands of a developing country would offset this CO<sub>2</sub> year after year for a one-time cost of less than \$4.00.

#### Global Cooling Communities

Ft. Lauderdale, Florida, a city of 150,000 people, requires 93 million kWh of electricity annually to keep the city running. That generates 72,400 tons of carbon dioxide per year. The city also uses 20,000 reams of paper per year.

Ft. Lauderdale could become a "Global Cooling™" city by planting 2,900,000 trees. This would be an exciting opportunity for two cities, one here and one in the developing country, to work together to plant the trees that both cities need. These trees would additionally offset far more than the number of trees cut each year to produce Ft. Lauderdale's paper needs.

What would be the cost of making the city "Global Cooling™"? In our program, it could be done at a one time cost of less than \$300,000.00. Spread out over ten years, that works out to about 0.3 cents (\$0.003) per kilowatt hour, or about \$2.00 per resident per year. In our program, it doesn't cost all that much to save our planet.

## Chapter XII: WHAT STUDENTS CAN DO TO COOL THE PLANET

Children across the USA are concerned about the environment, especially the threat of global climate change from pollution of the atmosphere with greenhouse gases.

In our "Tree Pals" program, they learn that just 40 trees planted on the barren lands of the humid tropics will remove one ton of CO<sub>2</sub> from the atmosphere every year.

They also learn that young people in the world's developing countries face an even more imminent threat from the destruction of their forests. These children and their teachers want to take an active roll in bringing back trees and forests.

TREES FOR THE FUTURE has developed a partnership between students here and in these developing countries. It's called the Global Youth Forest. The tree seedling nurseries are built on the school grounds. Students in these countries take care of the seedlings throughout the dry season. When the rainy season begins, the seedlings are transplanted onto barren hillsides, in local parks, and some around the homes of the students.

In the first year of this program, through a grant of \$65,000 from the Children's Earth Foundation, these young people, here and around the world, working together, planted 910,000 trees in six developing countries (Cameroon, Belize, Kenya, Nepal, the Philippines and Honduras): who says young people can't do anything?

How important are these trees? Children in the US know they remove pollution from the threatened global atmosphere, year after year, replacing it with life-giving oxygen. For the children of these faraway villages, these same trees protect barren lands, rebuild degraded soils, renew water sources, cool the air, restore habitat for birds and wildlife - and give people hope for a future.

#### How your school room can become "Global Cooling™":

Young people have the opportunity to show their determination to save the planet. Here's how you can work with students in another country so that a ton of carbon dioxide is taken out of the atmosphere, year after year, by each student:

a) In September, contact TREES FOR THE FUTURE (info@treesff.org, or phone 1-800-643-0001). They will send your

class an information package including enough seeds of several trees so that each student will be able to grow a few. These are trees that are easy to grow and will be popular in your area.

b) Plant the trees as a school science project. Through the winter, you may want to keep them on window sills so they get enough light. They will need regular watering (that includes Christmas and Spring breaks)

c) In April (Earth Day), hold a sidewalk or mall sale. You should be able to sell your seedlings to people in the community for about \$4 each (tell them that when they plant their tree, they're also planting dozens of trees in developing countries.

d) Use half the income for school projects. The other half is used to "adopt" a village school in a developing country, sending them seeds, training materials and on-site technical support. Your class will know the name and address of the school you have adopted, and the name of the teacher. Now get the whole class together and write them a BIG letter (send some photos - those students will want to know all about you so they can write back).



**TREES FOR THE FUTURE**  
**Trees Pal's Program**

### **A Short History of How TREES FOR THE FUTURE Began Its "Global Cooling" Program (and why TREES FOR THE FUTURE Holds This Trademark). - By Steve McCrea & Dave Deppner**

**August, 1987** - TREES is asked by Congress to provide their experience about planting trees on the world's degraded lands. This was considered in the passage of the U.S. Energy Policy Act of 1992, which allows tree planting to mitigate carbon emissions (paragraphs 1605-a. and 1605-b.).

**June, 1993** - TREES is invited to join the White House panel on Global Climate Change and continued to serve through 2000.

**May, 1991** - Steve wrote an article in a local newspaper recommending people should put themselves on a "CO<sub>2</sub> Diet".

**April, 1995** - Steve heard on a public radio station that the White House announced that the target for reaching the 1990 level of greenhouse gas emissions by the year 2000 would be missed. The explanation offered for not meeting the target of lower emissions was "the expanding economy". Increased travel and more economic activity lead to more combustion of fossil fuels so more carbon is produced. He wondered whether there might be a way of linking economic activity with some way of capturing the increases in carbon dioxide. This is when he next thought of the phrase "Put your business on a CO<sub>2</sub> Diet".

**May, 1995** - Steve contacted Lufthansa Airlines to inquire about the amount of fuel that is consumed on a typical trans-Atlantic flight. When searching for a "Zero Emission Vacation", he suggested that we need to plant trees in the tropics to obtain "global warming neutrality".

**June, 1995** - The CO<sub>2</sub> Diet appeared in Steve's application to the National Green Pages.

**July, 1995** - Steve first spoke with Dave Deppner and learned of his proposal for planting 200 trees in the tropics for every car: The trees would absorb the carbon dioxide emitted by the car's engine. This began the realization that tree planting reverses global warming. Because trees are cooling the planet, it should be called a Global Cooling™ car.

**August, 1995** - Steve spoke at a Renewable Energy Development Institute in Ukiah, California and sponsored enough trees planted in the tropics to make the conference "Global Cooling™": the beginning of our "Trees for Travel" program.

**September, 1995** - A public relations representative for an oil company mentioned that his corporate attorney would have to examine the

proposed "Global Cooling™ gasoline" idea to see if it needed trademark protection. In a defensive move, to protect the rights of TREES FOR THE FUTURE to use the phrase Global Cooling™ in its literature, Steve designed a logo with the "GC" in the center and "Registered with Trees for the Future" on the outside ring.

**October, 1995** - Dave Deppner applied for a trademark of the seal. Since that time, TREES FOR THE FUTURE holds legal claim to the phrase "Global Cooling™" and looks forward to licensing the use of the phrase to businesses and individuals who offset their global emissions by planting trees.

**-Steve McCrea**, Advisor on Global Carbon Emissions



## What Is TREES FOR THE FUTURE?

This program started in several developing countries in the early 1970's when several concerned people, working as volunteers in rural development, began to see for themselves the devastation brought about as the world's forests were cleared and burned.

In the dry season we saw the mountains burning as upland farmers, desperate to feed their families for another season, burned the remaining brush into fertilizer. When the rains finally came we saw the flash floods, and the women of the lowlands searching through piles of dead bodies, trying to find their children. We saw the thousands of homeless families crowding into city slums, desperately seeking any employment because their own land would no longer support them.

And we saw that the programs of the international development agencies were unable to bring help to the people of these remote villages where the devastation was taking place.

We felt these people, and the world, deserved something better. Working with our local counterparts, learning as we went, we began to develop simple, but practical, projects to help these communities return tree cover, then forests, to these devastated lands. People accepted these ideas, seeds of trees they could plant, and the word spread from one village to the next.



**TREES Director Dave Deppner** receives **Earth Trusteeship Award** from **Dr. John McConnell** and **UN Undersecretary Xavier**, **United Nations**, New York, **March 20, 1994.**



*During the Dedication of our new Ruppe Center, June 10, 1999, **Assistant Director of the US Peace Corps, Chuck Boquet** (RPCV Somalia) thanks Trees for the Future for our close and continuing partnership with Peace Corps.*

Now, more than 30 years after we helped people plant those first trees, we are an organization of more than 4,000 active members. Over these years, we have helped people plant nearly 40 million trees worldwide: every year, these trees remove more than a million tons of carbon dioxide from the global atmosphere - an area of over 60,000 acres of once degraded land returned now to environmentally sustainable productivity!

This is the work of some 70,000 families, in 9,000 villages scattered throughout Asia, Africa, and the Americas. It's been a lot of work, a lot of frustration, pain and misery but also a lot of joy, friendship, laughter, and a feeling of accomplishment.

Above all, it's been a path the world can follow if they want to do something about the threat of global climate change we all face - and about the closely related threat, again to all of us, coming from the continuing destruction of the world's forests.

We've made our choice. Now it's your choice: global warming?  
or Global Cooling™?

**This Publication  
has been made possible  
through the kindness and generosity of:**

*If you would like to support the production of this booklet,  
please call or email Trees for the Future today.  
info@treesfff.org 1-800-643-001*

## COUNTING CARBON? Here are some helpful hints

### Driving A Car:

A compact car driven 13,000 miles in a year emits 10,000 lbs.. of CO<sub>2</sub>. - **Plant 200 trees!**

A medium-size car emits 1,000 lbs.. of CO<sub>2</sub> for every 1,000 miles you drive. - **Plant 20 trees!**

### Traveling by Airplane:

For every 1,000 miles you fly, your trip puts 500 lbs.. of CO<sub>2</sub> into the global atmosphere. - **Plant 10 trees (don't forget the return trip)!**

### Shipping Freight by Air:

Multiply the weight of the shipment by the number of miles flown. Divide by 400. This gives you the number of lbs.. of CO<sub>2</sub> emissions. Example: a 500 lb. shipment flown 1,000 miles = 1,250 lbs.. of CO<sub>2</sub>. (500 lbs.. x 1,000 miles/400 = 1,250 lbs.. CO<sub>2</sub>. - **Plant 25 trees!**

### Heating Your House:

Heating an average two-bedroom house puts 3.9 tons of CO<sub>2</sub> into the atmosphere yearly. - **Plant 160 trees!**

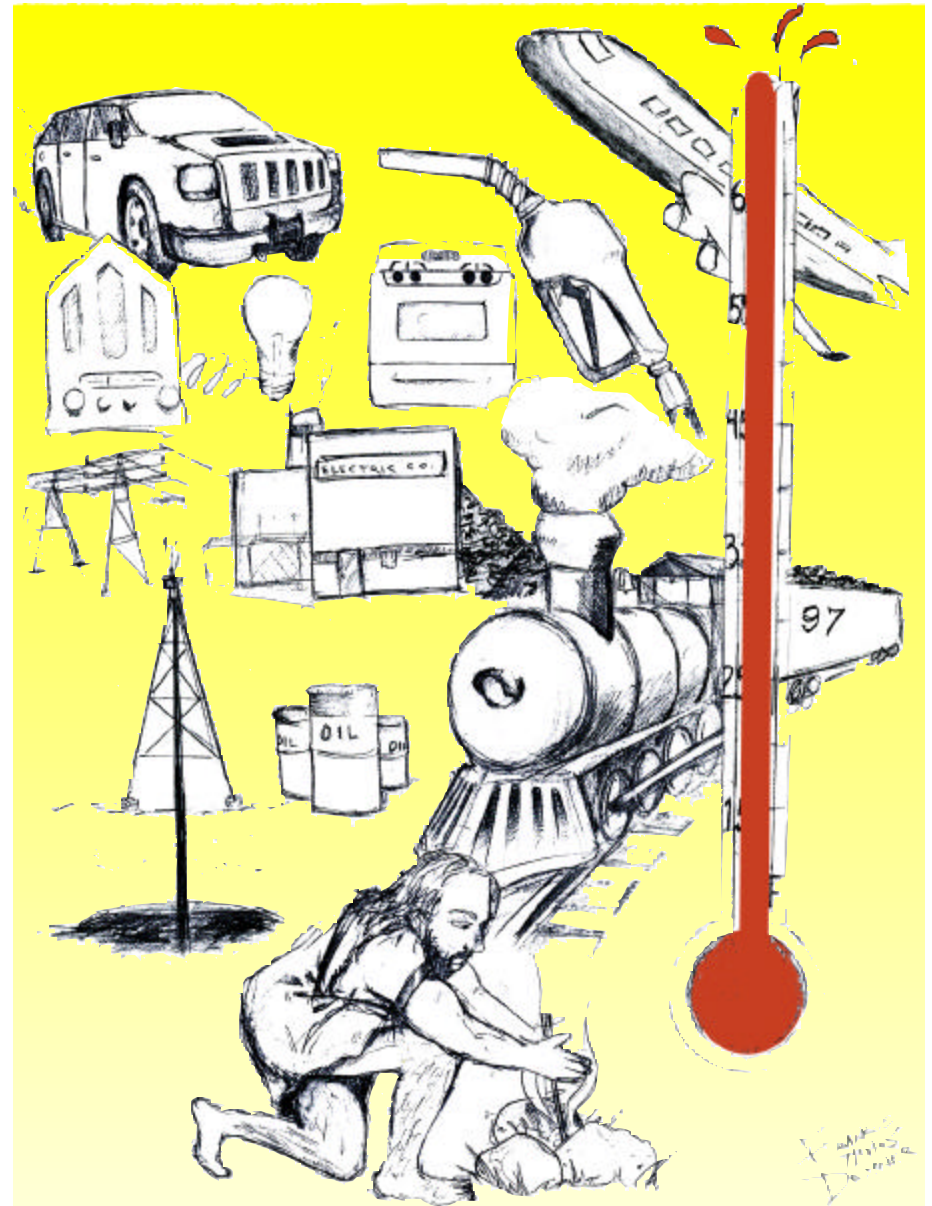
### Your Electric Bill:

Your electric bill is calculated in kilowatt Hours (kWh). Each kWh generated produces about 2 lbs.. of CO<sub>2</sub>. If your monthly bill is 500 kWh, that's 1,000 lbs.. of CO<sub>2</sub> going into the atmosphere. **Plant 20 trees.**

**How much is all this going to cost?** You'll be surprised how little it costs to "go cool". In the program of **TREES FOR THE FUTURE** you can plant a tree for just ten cents (\$0.10).

**If you plant an acre of trees** in a developing community, at a rate of 50 lbs.. per tree per year, each year these trees would sequester about **16,000 lbs.. of CO<sub>2</sub>** - that's almost as much carbon as the average American puts into the atmosphere!

Your trees will keep on removing this carbon year after year. And two families in that village will thank you because your generosity has restored sustainable productivity to an acre of land where they can again grow their food.



a publication by  
**TREES** for the  
**FUTURE**  
[www.plant-trees.org](http://www.plant-trees.org)

The  
**GLOBAL**  
**COOLING**  
Action Center