

THE OFFICIAL



earth day

guide to

planet repair



Denis Hayes

Chairman and CEO, Earth Day

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A Lark Production

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Eco-IQ Quiz

Can you answer these questions? If not, read on to learn everything you need to know about global warming so you can help repair the planet.

1. What is the difference between a carbon sink and a kitchen sink? (See page 21.)
2. Why do ice sheets worry scientists? Why don't ice shelves? (See pages 18-19.)
3. Will strong CAFE standards affect Starbucks? (See page 131.)
4. What is the greenhouse effect? (See page 10.)
5. What is the most energy-efficient mode of transportation? (See page 70.)
6. Which produces more greenhouse gas emissions—your car or your house? (See page 77.)
7. What kind of light bulb is the energy equivalent of an SUV? (See page 98.)
8. How many people live on the earth today? (See page 3.)
9. How much faster than the human population is the car population growing? (See page 50.)
10. What is the source of almost all energy on earth? (See page 37.)
11. Do coal-fired power plants produce more or less greenhouse gas than plants that run on oil or natural gas? (See page 30.)
12. Does the Energy Star have anything to do with astronomy? (See page 80.)
13. Does a city resident have as high a chance of being mugged as a suburbanite has of being hurt in an automobile accident? (See page 72.)
14. How much energy does it take to dry your clothes on a clothesline? (See page 108.)
15. Do you Kyoto? (See page 135.)

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Limited Warranty



The environmental movement has displayed remarkable strength and intelligence since the first Earth Day in 1970. It has battled heroically to safeguard the world's health, diversity, and beauty, and it has been astonishingly successful. However, as the Earth's odometer rolls over into a new century, the Earth is facing a new threat—global warming—that dwarfs earlier perils.

We fought in the early years to establish the Environmental Protection Agency and pass laws to protect the air, the water, and endangered species. By Earth Day 1990, our efforts had spread around the world and our participants had increased tenfold. That international groundswell contributed greatly to the success of the Earth Summit in Rio de Janeiro in 1992, and led to the creation of new environmental protection agencies in many other countries.

In the United States, environmental concerns now influence the nation's investments, its lifestyles, and its laws. The right to a safe, healthy environment—a concept that essentially did not exist before 1970—has become a core American value. Today it enjoys wider, deeper public support than some values enshrined in the Bill of Rights.

Three decades after the first Earth Day, the bald eagle is no longer endangered and the Great Lakes are returning to life. Air pollution has decreased by more than a third, even though we now are driving almost twice as many cars more than twice as many miles a year. The Cuyahoga River no longer catches on fire, and hundreds of streams, lakes, and bays are swimmable. Millions of people choose to recycle, conserve water and energy, eat lower on the food chain, and limit their family size for environmental reasons. Earth Day has become a movement, not just a once-a-year event.

Most of this change has been immensely popular. Maybe too popular; too much save-the-earth chatter can drown out truly urgent messages and leave people feeling confused. Although polls show strong support for the environment among all income groups, educational levels, geographic regions, and ethnic backgrounds, the same polls contain a contradiction. Although most people believe that the global environmental problems that face us are real, they view these problems as too huge, too complex, and too abstract for them to do anything about. This Earth Day Guide was designed to overcome that inertia.

Earth Day helps the average person, the nonscientist who cares about the future of the Earth, learn how to have an impact. Here are a few of the daunting challenges that we need to face up to, soon:

- Most of the world's great biological systems are in a state of collapse because we have logged, trawled, or cultivated them to maximize short-term production. Both plant and animal species are disappearing at the fastest rate in 65 million years.
- The world's *existing* human population—six billion—is already three times as great as the planet's long-term carrying capacity if all people seek a level of affluence comparable to that currently enjoyed in, say, Sweden.
- We have carved two giant holes in the ozone layer, vastly increasing the exposure of people, plants, and animals to damaging radiation from the sun. Although the industrial North, the source of most ozone-destroying chemicals, has made important progress on this issue, much of the rest of the planet is not yet on board.
- We have raised the temperature of the entire planet and set in motion a series of inexorable forces that will raise it a lot more before we can stop the climb. Even if we now act decisively, it will take many decades to undo the damage.

Call to Arms

Our species has always altered its immediate environment. Ancient farmers converted the Fertile Crescent—the fabled Babylon—into the desert wastes of Iraq. But we have never before had the capacity to change the entire planet. In the last half of the twentieth century, for the first time in history, *Homo sapiens* became a geophysical force.

“We are modifying physical, chemical, and biological systems in new ways, at faster rates, and over larger spatial scales than ever recorded on Earth,” Dr. Jane Lubchenco, former president of the American Association for the Advancement of Sci-

ence, recently warned the nation's scientific elite. "Humans have unwittingly embarked upon a grand experiment with our planet."

For example, there is little serious debate in the responsible scientific community about the reality of global warming. Yet the existence of this scientific consensus behind global warming comes as a surprise to many Americans, even literate Americans who pay close attention to the news. Every time they read a news story about a new global warming study, they encounter a quotation from someone saying that global warming is "unproven." Few readers notice that virtually all the skeptical quotations come from the same half-dozen right-wing zealots. Similar misinformation is spouted by a handful of fanatics who think the world has too few people, not too many, or that CFCs don't destroy stratospheric ozone (although those who explained the chemistry have already been awarded a Nobel Prize for their discovery).

Countering this brownlash are the most prestigious scientific bodies in the world. The U.S. National Academy of Sciences and the U.K. Royal Society issued a joint paper in 1992 that stated, "The future of our planet is in the balance. Sustainable development can be achieved, but only if irreversible degradation of the environment can be halted in time. The next 30 years may be crucial."

This is not fear mongering by overwrought extremists, but a carefully phrased warning from the world's finest scientists. These scholars are trying to call public attention to the fact that the world has entered a dangerous new era.

Avoiding irreversible planetary calamity is the primary moral obligation of our time. This profound mission is what makes the modern environmental movement more than "just one more special interest."

It's a Very Small World

For 30 years the environmental movement has done many things well. It has enlisted superb scientists, teachers, managers, and lobbyists. It has produced some of the most creative and successful litigators in the history of American jurispru-

dence. Our best universities now teach courses in conservation biology, environmental law, and environmental engineering.

But we are now facing an utterly different set of environmental challenges, rooted in our global interdependence. Back in 1970, New England *states* sought to control sulfur emissions from upwind power plants in the Midwest. Thirty years later, *nations* now have a legitimate interest in the environmental behavior of other sovereign states. Greenhouse gases emitted in Germany affect the climate in Africa. Ozone-depleting chemicals used to clean computer chips in India contribute to skin cancer rates in Australia.

Many environmental issues involve thresholds that act as one-way valves: once you pass the threshold, there is no going back. To take some obvious examples, once a species becomes extinct, it cannot be restored to life. Once a denuded hillside loses all its topsoil, it cannot be reforested. Once a barrel of oil is burned, it is gone forever.

Energy and Global Warming

Earth Day 2000 will focus unprecedented international attention on energy and climate change—a particularly clear example of a problem that involves thresholds and that requires international cooperation. No other issue intersects with a wider variety of environmental problems than what kind of energy we employ to power society, where we get it, and how efficiently we use it. The wasteful use of outdated energy sources is producing climate change, oil spills, strip mines, nuclear waste, plutonium proliferation, smog, sulfate particulates, acid rain, childhood asthma, and myriad other environmental ills. Energy also addresses issues of social equity, national security, balance of payments, political influence, and oligopoly control. You don't have to be an expert on each of these issues, as long you get the general drift. Energy is a core concern of the modern world, and it is often a scary business.

Global warming—the greatest environmental consequence of mankind's current fuel choices—itself will cause many other environmental impacts: coastlines and rich agricultural river deltas will flood; marine and terrestrial species that cannot

adapt to a swift temperature shift will die; agricultural productivity in the world's grain belts will decline; new diseases will spread in epidemic proportions; rainfall patterns will change; and so forth.

Although these issues are of global importance, they can be addressed at every level, from the family kitchen to the United Nations. Energy and global warming are enormously complex, yet there is a simplicity that lies on the other side of the complexity. *A huge majority of social and economic interests will win as a result of a transition to "green" energy sources and uses, while a comparatively small number of (very powerful) economic interests will lose.* Whenever progress has been made on a global environmental problem, it has been due to a worldwide outpouring of public sentiment that overpowers those with a vested interest in the status quo.

Today, most Americans enjoy the fruits of a robust economy powered by cheap fossil fuel. It's the best possible time to launch a national initiative to put our enviable technological ingenuity to the test and shift to low-carbon energy. Every country has sun, wind, and biomass (organic material such as firewood, paper, or orange peels that can be converted to fuel). By developing these resources, nations can inoculate themselves against unpredictable political winds in the handful of countries where most of the world's oil and coal are located.

But what can you, a single individual, do? Far more than you might think. This book offers common-sense advice for a two-pronged approach to saving the Earth: (1) take control of your own life, and (2) pressure politicians to change how they run the world. On the following pages, you will find a strategy to reduce your own energy consumption by half, almost without noticing, and learn how to encourage and take advantage of greener energy sources.

Some of these suggestions are pretty simple; other proposals are more challenging to our ingrained ways of thinking. Some you can do immediately, while others involve a commitment over time and even generations.

This book emphasizes solutions. You can show your kids how their personal choices, your family's lifestyles, and your

government's position on renewable energy can have a positive—or negative—effect on the world. It's a simple legacy you can pass on by simply setting a good example.

How's Your Energy Level?

Earth Day, as a movement, is pushing for energy efficiency and for clean energy sources as the alternatives to global warming from wastefully burning carbon-rich fuels. The time is long overdue to accelerate this transition. Twenty-seven years after the first oil embargo, fourteen years after Chernobyl, eight years after the UN Earth Summit in Rio, and three years after the Kyoto Climate Conference, we have made little progress.

Every year, the world produces more carbon dioxide than the year before. Global carbon emissions have increased four-fold in the last half century. Emissions could easily quadruple again in the next half century, unless humanity mobilizes to prevent it.

The case for energy efficiency has long been made, but in recent years it has fallen on unhearing ears. Despite huge improvements in the energy efficiency of lights, appliances, buildings, industrial processes, etc., *per capita energy consumption in the United States is now back within 2 percent of the peak in 1973, before the first oil embargo.*

The reasons for this are straightforward:

- We buy bigger cars. Minivans, sport utility vehicles, and pickup trucks now comprise 51 percent of all new vehicle sales.
- We buy bigger homes. Houses have ballooned from an average of 1,600 square feet in 1973 to 2,100 square feet today, even though the average household has shrunk from 3.6 to three people.
- We own more electrical gadgets. Energy use by computers, video recorders, dishwashers, and clothes dryers has been growing 5 percent per year since 1973.

Industry achieved enormous improvements in energy efficiency per unit of output from 1973 to 1986, but then plateaued. As industrial output grew over the next decade, energy use grew along with it. (Fortunately, over the last two years industrial energy efficiency has once again improved.)

Existing technology can reduce energy consumption in most countries—and most definitely in the United States—by a factor of three or more. Energy efficiency saves money, benefits the economy, creates new jobs, and improves human health.

About the Book

The first step in solving problems is identifying them. Toward that end, the book's next section, **Global Warnings**, outlines the effects of global warming, from more bad weather to increased disease, from rising oceans to declining agriculture.

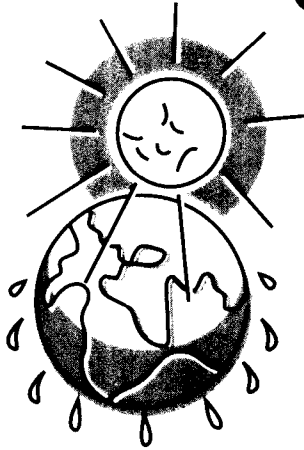
Refueling: Clean Energy explores the pros and cons of the energy sources we can choose from, and explains why Earth Day votes for renewable energy as the Earth's best hope.

The core of the book, **Operating Basics: Clean Living**, outlines simple things you can do to reduce your own energy use; **Troubleshooting: Clean Power** then lays out some things you can do to affect the world's energy use. For people of all economic backgrounds, Earth Day aggressively promotes national, local, and individual energy choices that produce no net carbon dioxide, no radioactive waste, and no materials that can be made into nuclear weapons.

Finally, **Extended Warranty: Resources and Activism** is a highly selective resource section for readers who are inspired to do more to keep the Earth alive and well.

That Earth Day has survived as an annual international event is a heartening testament to the strength of a good idea. It is also evidence that substantial numbers of us can transcend our troublesome tribal reflexes and embrace the reality that we all live in a place known as Downstream. So, as you read this book, I invite you to become part of Earth Day—every day. 🌱

Global Warnings



How much hot water are we in?
This section tells how warm the globe has gotten, how high the water is rising, how sick we humans might become, and how fast the Earth's plants and animals are vanishing. It's not a pretty picture, but if we don't focus on it, it will only get worse.

The Gathering Storm

Scientists have determined that the five warmest years since the fifteenth century were all in the 1990s.

You've heard about global warming for years, but you may have only a vague sense of what it is. Global warming is caused by the *greenhouse effect*. Sunlight streams through the atmosphere, strikes Earth's surface, turns to heat, and then is radiated back toward outer space. But some of this heat is trapped by warming gases in the atmosphere and reflected back to Earth. These warming gases, such as carbon dioxide (CO₂), allow sunlight to pass in, but like the glass in a greenhouse, they block heat from escaping. As we pump more and more CO₂ into the air, more heat is trapped.

Your grandparents breathed air that contained about 280 parts per million CO₂. Your own most recent breath contained about 370 parts per million. The concentration is increasing by about two parts per million each year, and the rate of increase is accelerating. Within a few decades, you will breathe air containing *twice as much* CO₂ as the air your grandparents breathed unless we radically change our use of carbon fuels such as coal and oil. *Our air already contains more CO₂ than at any time since long before the first humans evolved.*

Scientists and world leaders acknowledge that the increase in greenhouse gases is already raining on our parade in the form of weird weather. The American Geophysical Society states that no other known phenomenon could explain the rise in temperature we've already experienced.

Heat is a form of energy. So, as the temperature rises, more energy accumulates in the atmosphere to power the Earth's great climate engines. More water evaporates more rapidly, later to be returned to the Earth in torrents. Some of this atmospheric energy is channeled into violent storms. Floods, monsoons, droughts, and hurricanes all are setting new records. For example, 1998 was the twentieth year in a row with a global mean temperature above the long-term average, and it had many extreme temperature-related disasters:

- 2,500 people drowned and 56 million were driven from their homes in the Yangtze River flood in China.
- The monsoon season left two-thirds of Bangladesh under water for more than a month and rendered 21 million people homeless.
- Hurricane Mitch hit Honduras with 180-mile-per-hour winds, washed away an estimated 70 percent of all crops, left 11,000 dead and a third of the population homeless. A year later, Honduras faced a major health crisis because Mitch had destroyed every sewage-handling facility in the country.
- 45 countries experienced severe droughts, many accompanied by runaway fires. The prolonged drought left Russia with its lowest grain harvest in 40 years.
- Healthy rainforests don't burn, but 1998 saw serious fires throughout Southeast Asia and the Amazon. Fires in southern Mexico were so extensive that they led to air quality alerts throughout Texas. Fires caused Florida officials to evacuate an entire county.
- In India, 3,000 people died of heat stroke.

Clearly, 1998 weather provided a “signature that the global warming we expected is rearing its head,” as Kevin Trenberth of the National Center for Atmospheric Research put it.

If you are concerned that one year isn't enough evidence, scientifically speaking, don't worry. The world's climate scientists came to their belief in global warming after many decades of gathering information:

- Since record-keeping began in 1866, the 14 warmest years have *all* occurred after 1980. The temperature in 1998 was the hottest ever recorded, and represented the largest annual increase ever recorded.