

GLOBAL WARMING

An Island Press Reader

Finding Your Voice

Finding your voice



ISLAND
PRESS

Global Warming: An Island Press Reader

Table of Contents

Ignition: What You Can Do to Fight Global Warming and Spark a Movement By Jonathan Isham and Sissel Waage Excerpt taken from the Introduction <i>Bill McKibben</i>	1
Apollo's Fire: Igniting America's Clean Energy Economy By Jay Inslee and Bracken Hendricks Excerpt taken from "The First Apollo Project"	7
The ECO Guide to Careers That Make a Difference: Environmental Work for a Sustainable World By The Environmental Careers Organization Excerpt taken from "A Conversation with Eileen Claussen"	13
Global Environmental Governance By James Gustave Speth and Peter M. Haas Excerpt taken from "Alternative Visions: How to Change the System"	23
Lives Per Gallon: The True Cost of Our Oil Addiction By Terry Tamminen Excerpt taken from "The Quality of Mercy"	36
Apollo's Fire: Igniting America's Clean Energy Economy By Jay Inslee and Bracken Hendricks Excerpt taken from "A Tale of Two Presidents" <i>Jay Inslee</i>	46

**The Hype About Hydrogen: Fact and Fiction
in the Race to Save the Climate**

By Joseph J. Romm

Excerpt taken from “Choosing Our Future”

49

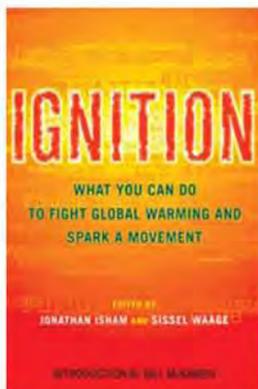
**Ignition: What You Can Do to Fight Global Warming
and Spark a Movement**

By Jonathan Isham and Sissel Waage

Except taken from the Afterword

Jared Duval and Nathan Wyeth

59



Ignition: What You Can Do to Fight Global Warming and Spark a Movement

Edited by: Jonathan Isham and Sissel Waage
Introduction by Bill McKibben

Paperback: \$18.95 | ISBN 1-59726-156-4
304 pages | 6 x 9 | Figures. Index.

Introduction

BILL MCKIBBEN

IN MID-SUMMER 2006, I HAD a feeling of despair (a strong one) and an idea (a bad one). I imagined walking from my home in central Vermont fifty miles to the state's main city, Burlington, and, once there, getting myself arrested on the steps of the federal building while protesting Washington's inaction on global warming. I wasn't sure what good that would do, aside from make me feel a little less helpless, but that didn't stop me from e-mailing friends and neighbors, asking if they wanted to go along.

Surprisingly, a good many did. Better yet, many wanted to help out. Those colleagues proved to be more astute planners than I was; it took them only a few phone calls to figure out that you really couldn't be arrested in Burlington, not without breaking something, which was not our style. So we jointly evolved the idea of a march across the same fifty miles, but with a different aim: we would ask all Vermont's candidates for federal office in the fall election to meet us by Lake Champlain and pledge to support strong climate legislation.

Thus began a month of nonstop organizing, most of it done by people more competent than me: Will Bates, for instance, a recent Middlebury College graduate with a quiet knack for getting things done; Becca Sobel, a Greenpeace organizer who was already in the state working on global warming and who now joined our efforts; Connie Leach, who at the very first coffee shop meeting said, "I'll take care of the food" and proceeded to

do just that; Steve Maier, our local state representative, who started calling his fellow politicians; Jon Isham, a Middlebury College colleague; and on and on and on.

Here's what we learned in those weeks. Many people want to do something about climate change, something real and large and meaningful. They've already put in some compact fluorescent lightbulbs, and maybe they've even bought a Prius. Yet they realize that those moves are small stabs in the dark, that if we have a chance at dealing with global warming, it's going to require quick and decisive political change. Almost everyone we asked said either "Count me in" or "If I wasn't going to be away on Labor Day weekend, I'd be there." Many were overjoyed to be asked, and people thanked me repeatedly for giving them the "opportunity" to trudge across the late summer countryside. That should give us a clue: the climate movement is rich in scientists and economists and engineers; we have no shortage of answers, of analysis. Until now, however, we've never bothered to build the *movement* part of the movement. There's been no way for people to really engage in the process of fighting for change, no way to make very deep fears and hopes public and powerful.

Given the opportunity to be part of the movement, however, three hundred people showed up on Thursday noon to start the walk. That may not sound like many folks except that it was a workday, we were gathering in one of the state's smallest and most remote towns, and we were planning to go eleven miles before supper. We listened to a few talks, most notably John Elder, one of Vermont's most beloved writers, who dressed as an endangered maple tree and read from Robert Frost's poem "The Road Not Taken." It was in homage to Frost that we'd come to this small burg of Ripton; the great poet's summer writing cabin was a few hundred yards from the roadside turnout where we stepped off. With his words ("I took the one less traveled by/And that has made all the difference") ringing in our ears we hit the road, with a crew of real pros from Greenpeace out front to slow down traffic and keep us safe.

And what do you know? Three hundred people walking two and three abreast down a winding country road turns out to be one hell of a long line. We felt buoyant from the very start, a crowd of kids and elders and moms and college students and golden retrievers on a perfect late summer

day, walking through a landscape we loved and also knew to be threatened by a warming atmosphere.

By late afternoon we'd reached the town of Middlebury's green, where more people were waiting for us, waiting with banners and music and food. We heard speeches from our Middlebury College president, Ronald Liebowitz, and from a chief aide of Patrick Leahy, one of our state's two senators. Then came dinner—a potluck pulled together by one of the local churches—and sleep.

That was the rhythm of the next few days: long walks (ten miles on pavement is much more tiring than ten miles on mountain trail), long conversations (with the whole day stretching out, there's no reason to give the short version of any story), and a steadily growing sense of optimism. We mostly hiked along Route 7, western Vermont's main north-south thoroughfare, on the left shoulder, facing traffic, which meant that we could see drivers as they passed. They'd read our signs, and by the time they were halfway down the line of marchers, three-quarters of them would be honking or waving or both. (The great danger was overexcited hybrid car drivers veering wildly in their enthusiasm.) It was clear that, at least on this road, climate change was not an iffy proposition or a hard sell; the reaction fit those public opinion polls showing that 80 percent of Americans understand that we have a problem (even if they might not be willing yet to march themselves, or even to countenance higher gasoline prices). Every night we'd have a wonderful meal: a wheat farmer used a newly built cob oven to bake us pizzas by the score, an activist opened her waterfront home not only for supper but for a much-needed swim in the lake. We got used to stirring welcomes, such as a rock band on the lawn of the senior center. And as we walked, and as our numbers grew, we began to pull in rumors that many of the politicians we wanted to hear from were actually planning to come to our final rally.

Sunday morning began with a church service so crowded that people were spilling out of every door of the sanctuary, so crowded that the communion wine ran out before everyone was served. That didn't matter much, though, for there was a communion of song and spirit that rocked the halls. That night we bedded down at Shelburne Farms, one of Vermont's great institutions. This conserved farm on the shore of Lake

Champlain features, among other things, the northern hemisphere's largest wooden building, originally built to breed horses to pull cabs, but this night put to use for a dance and for talks from local business owners, local farmers, local clergy. In the morning, a bagpiper waked camp. By now, there were six hundred of us wrapping blisters and munching bagels, ready to take our cause from the small country towns into the heart of what passes for urban Vermont. As we marched by the car dealerships and strip malls, the line kept growing. Soon, more than a thousand people were marching, with television crews and wire service photographers hustling to get their pictures. Vermont is a small state—this march was its largest political demonstration in many years—and as we wound through the streets of downtown Burlington in a line too long to see from any one corner, we could feel our power.

This power was confirmed when we finally reached the rally site. There, along with many supporters, were all the major state candidates for federal office, and they were not just the obvious suspects like Bernie Sanders, Vermont's progressive representative who was now seeking a Senate seat. Also there were the state's Republicans: Sanders's opponent Rich Tarrant, for instance, who for weeks had been running vile ads about immigration, and Martha Rainville, the former commander of Vermont's National Guard, who only weeks before had declared at her first campaign press conference that she wasn't sure global warming was even caused by humans, that maybe it was just a natural cycle and perhaps we should do some more research (she seemed to have changed her mind now).

One thing we had decided from the start was that we didn't want vague declarations of concern, nicely worded promises of shared worry and possible action, from our politicians. Rather, we wanted them to sign on to the legislation that our retiring U.S. senator, Jim Jeffords, had offered earlier that summer. The companion to California Rep. Henry Waxman's House bill, Jeffords's legislation called for 40-mile-per-gallon cars, 20 percent renewable energy by 2020, and 80 percent carbon reductions by 2050. These steps are not enough to solve global warming, but this bill was the most ambitious one introduced in Washington so far. Not even the House Democratic leadership was embracing it, but we were. We had the key points written on a huge sheet of paper, and we had the youngest marcher who'd gone

the whole distance, thirteen-year-old Schuyler Klein, ready with a giant felt-tipped pen to hand to the pols as they stepped to the microphone.

First, though, came a word from the future. Three of the nation's most dedicated climate activists, college students May Boeve and Jamie Henn and recent college graduate Jared Duval (a contributor to this book), stepped up to the mike. They had walked every inch of the trail, and now they asked the other young people in attendance to join them on the stage. Toddlers toddled, high school kids sidled shyly up, and soon there were approximately 120 young people standing on the stage. The three leaders took turns saying pretty much the same thing: these people are the ones who will deal with the effects of your decisions the rest of their lives. Look them in the eyes, damn it, and then tell them that you're not ready to take real action.

After that, it was kind of spooky. One by one, the candidates came forward, took the pen, made their mark, spoke their piece. Sanders, of course, delivered big time; he promised to a mighty roar that he'd reintroduce the Jeffords bill on the very first day of the next Congress. Tarrant was almost as vigorous; ditto Rainville and her Democratic opponent, Peter Welch. Only the incumbent governor didn't show, which was his mistake because the crowd was generous to a fault, cheering everyone no matter their party label. They were cheering, but not kowtowing, for that afternoon we had the unmistakable sense that for once the political leaders were responding to our agenda, not the other way around. We let each of them speak for three minutes only; we'd walked far enough, we'd acquired enough moral capital that we got to set the ground rules. It was a true Vermont town meeting, with business to accomplish, not a set-piece photo op controlled by the candidate's advance team.

What stood out was how easy it was to get agreement from even those candidates who had never made the issue a priority. It reminded me of a political truth that's easy to forget: you don't need everyone. You don't even need 51 percent. All the moaning about how "the average guy" doesn't really understand climate change is beside the point; 5 percent of the population is plenty to roll politicians as long as that 5 percent is committed, as long as that 5 percent is willing to get up and walk. We've won the battle of the science and even the battle of perception; today, most Americans believe that human's effect on climate is a real problem. Now we've got to

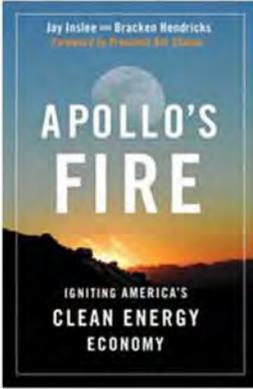
win the political battle, the one where we're pitted against ExxonMobil. That company made a \$36 billion profit in 2006, which buys plenty of politicians, but only if there's no one pushing from the other side. One thousand people are enough to push back and win three votes in Congress. Sure it's Vermont; sure it will be harder in Texas. Yet it's worth a try anywhere; in fact, it's worth more than a try.

One of the small secrets was that we had fun. There was much music along the way—a good reminder that most of the movements that have worked in this country have been singing movements—and lots of religion, too. I kept haranguing the pastors who joined us to march in their collars, to demonstrate that the faith community was finally understanding the centrality of these issues.

The other secret, the really crucial one, is that people get it. Twenty years ago, climate change was hard to understand and obscure, but not anymore. Plenty of people, more than enough to constitute a movement, understand what's going on and feel it in their hearts. And plenty more, even if they lack that commitment, will wish us well. We've been banging our heads against this wall for so long that we've become accustomed to thinking that change is impossible, that the forces on the other side are just too strong, that ExxonMobil will always carry the day. Indeed, we've intimidated ourselves into not even trying; at best, we try to work out "partnerships" with industry. All that is fine and useful work, but history indicates that the best partnerships happen when both sides have reason to be on board. Our job is to be noisy and joyful and footsore and clever and devoted enough to create that reason. Onward!

Excerpted from *Ignition* by Jonathan Isham and Sissel Waage. Copyright © 2007 by Island Press. Excerpted by permission of Island Press. All rights reserved. No part of this excerpt may be reproduced or reprinted without permission in writing from the publisher. Island Press grants permission to forward this unaltered electronic document to friends, colleagues, and other interested parties.

Please click [here](#) to return to the main table of contents



Apollo's Fire: Igniting America's Clean Energy Economy

By: Jay Inslee and Bracken Hendricks
Introduction by President Bill Clinton

Hardcover: \$25.95 | ISBN 1-59726-175-0
416 pages | 6 x 9 | Figures. Manuscript. Index.

THE FIRST APOLLO PROJECT

We choose to go to the moon in this decade and do the other things, not because they are easy, but because they are hard, because that goal will serve to organize and measure the best of our energies and skills. . . .

—President John F. Kennedy

On the evening of May 25, 1961, a man walked into the United States House of Representatives bound to set his country on its longest journey ever. They swarmed about him like bees in a congressional hive as he made his way down the choked center aisle. They all wanted a piece of his glamour, his charm, and his youth. President John F. Kennedy had come to deliver a special address to Congress.

Presidents did not do this very often. An American commander in chief entering the chamber just after the sergeant at arms has announced, “Ladies and gentlemen, the President of the United States,” always sends a thrill through the thousand people gathered for this uniquely American event, but this time it was an electric current several thousand watts more intense than usual. The congressmen and senators pushed toward him like teenyboppers at the Elvis concerts then sweeping the globe.

After years of national malaise, Kennedy had lit up the country with a charm and youthful spirit that brought Camelot to the shores of the Potomac. The country felt an optimism and sense of possibility it had

not experienced since before World War II and the Great Depression. He embodied the nation's creative energy boiling just below the surface and waiting for a leader to bring it forth.

As the president wound his way toward the speaker's rostrum, he no doubt had put out of his mind his titanic failure just two months before, when he had given the go-ahead for the Bay of Pigs attack on Cuba, then watched as the attack collapsed. What he was about to do would permit no self-doubt.

As he handed copies of his address to Vice President Lyndon Johnson and Speaker of the House Sam Rayburn, he knew he had to give the country a sense of unwavering confidence in the possibilities of a grand journey. That requirement was made all the more urgent by the fact that the country had no idea what he was going to say. He knew it would be a bolt out of the blue.

Ten minutes into his speech, he gave the United States a mission of exploration unequalled since Thomas Jefferson sent the Corps of Discovery, led by Lewis and Clark, across the American continent: "I believe this nation should commit itself to achieving the goal, before the decade is out, of landing a man on the moon and returning him safely to earth."¹

Thus, the Apollo Project began.

Those twenty-nine words changed America, the world of technology, and the moon. Only a few footprints were made on the moon, but they left a huge impression on America. Perhaps no other utterance in human history has resulted in such a stunning scientific advance in such a short period of time by such a large group of people. One can be impressed with other declarations, such as Archimedes's "Eureka!," but he was just one man in a bathtub. Kennedy rallied a whole nation to a singular cause whose completion could only be the product of the synchronized labors of literally millions of people.

At that moment Kennedy's boldness bordered on recklessness. As he stepped across the threshold of the race to the moon, America was in a distant second place to the Soviet Union. Yuri Gagarin had become the

first man in space by making several full orbits in April 1961. America could respond only by rushing a small “spam in a can,” a one-man shot for fifteen minutes, into the edges of the frontier. The Russian missiles were several times as powerful as NASA’s. Kennedy knew the Soviets would soon achieve the feat of putting multiple men in one capsule orbiting the earth. America had not yet even invented Tang.

But Kennedy knew three fundamental things about the American people. First, he knew that Americans were the most prolific tinkerers, builders, and innovators the world had ever seen. The creators of the light bulb, the airplane, and the automobile shared a nationality. This was no accident. Americans are immigrants who have come from every corner of the earth, drawn by democracy and opportunity. We are bound together by a common culture of pragmatism and innovation, driven by determination and ingenuity, a commitment to results, and an innate optimism that we can achieve them, regardless of the odds. Kennedy knew that throwing a technical challenge to Americans is like throwing a dog a bone. Others may have been concerned that our rockets were weak, our life support systems unproven, and the missile engines needed to fire the second stages of the mission untested. But Kennedy knew that if he provided the first stage of the mission, the inspiration, the American people would supply the second stage, the technology.

Second, Kennedy knew that Americans are inherently competitive. George Patton was right: Americans love a winner. Now Kennedy was setting up the grandest race of all time, to the moon. The Russians served as the foil in this competition, pushing Americans to bend every ounce of creative technological force to the purpose of beating them. Kennedy knew that once such a national contest was begun, Americans would run like racehorses, chomping at the bit to get out of the gate.

Third, Kennedy knew that the American people would rally around the cause of national security, as just decades before they had rallied in response to World War II. With Russian satellites flying overhead, and now manned missions circling the globe, America was at risk of Russia

dominating space. He did not want the emptiness of space to be filled with Russian weaponry. He knew that a race to the moon would immediately become a proxy for a race for military supremacy in space. Here, in the Sputnik moment, fear was the driver, not hope.

Those three stallions of motivation were put into harness and allowed Kennedy to rouse the nation's interest and innovation. Talk to an aircraft engineer who came of age in the early 1960s, and you will find that he was motivated to go into aeronautics by the blaze of excitement surrounding the moon project. Ask a congressman why he voted to give Kennedy virtually every dollar he requested for the space program, and he will tell you it was self-preservation. America adopted the *Mercury 7* astronauts and insisted on seeing them fly.

The pace of invention Kennedy inspired was breathtaking. In 1961 engineers had rudimentary, back-of-the-envelope sketches outlining five different ways to get to the moon, none of them involving rockets



President John F. Kennedy at Cape Canaveral, attending a Saturn briefing by Dr. Wernher Von Braun. (NASA/John F. Kennedy Presidential Library and Museum, Boston.)

then in America's arsenal. On July 16, 1969, they launched the *Saturn V* rocket, a three-stage titan only one foot shorter than St. Paul's Cathedral in London, that had been tested only five times. We strapped three fighter pilots to the top of it and lit the candle for the first lunar landing of *Apollo 11*. In 1961 no human had even approached trying to dock one satellite to another. But just eight years later we docked an American lunar orbiter with a capsule containing the first two humans on the moon. Only fourteen years before Kennedy's address, Chuck Yeager had used nitrogen to power his "Glamorous Glennis" to first break the sound barrier. Not long after, Neil Armstrong and his crew used hydrogen to run a fuel cell to power their *Apollo* spacecraft as she sailed to the moon.

Seven months after his address to Congress, in a speech at Rice University, Kennedy captured the significance of the challenge in this way: "The space effort itself, while still in its infancy, has already created a great number of new companies, and tens of thousands of new jobs. Space and related industries are generating new demands in investment and skilled personnel, and this city and this state, and this region, will share greatly in this growth."² The nation grew rich not just technologically or strategically but economically, with contracts let in every state. Large companies like Lockheed and Boeing led the way, and small fabrication shops and tiny software developers grew as well.

That was just the beginning, of course. Despite the glamour of the technological developments in the original *Apollo*, they were really just the seeds of fundamental advances made in a host of scientific and technological fields. The entire computing power of the *Apollo* spacecraft is now nested in your cell phone. Those computing advances surely accelerated that day allowing companies such as Microsoft and Google to revolutionize the world. Anyone who gets a new hip or knee now can be thankful for the materials handling and fabrication developments in the exotic composites used in reaching the moon. Someday, when we install a solar panel or a stationary fuel cell in our home, it will be because of strides made in providing the electricity for the space program. Our daily lives, from the Internet to medical care to our ability to call

our teenagers on their mobile phones, are attributable to Kennedy's vision and Americans' response.

Apollo also proved the importance of backing vision with policy and investment. Meeting the challenge meant making a commitment to expanding the capabilities of the nation in both industrial might and intellectual prowess. Like the expansion of the railways before it, whose growth was accelerated by Lincoln's policies, *Apollo* could not get to the moon without vigorous governmental action.

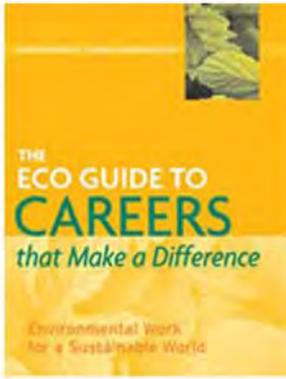
So Kennedy gave his people the most important service a leader can provide. He gave them a goal. He provided trusted leadership in rallying to that goal. He recognized the innate but dormant qualities of his countrymen. He offered them a compelling vision for putting those qualities to work. He then mobilized the resources to see the job through.

Today America is ready for that same kind of leadership. We face challenges every bit as daunting as we did in the days of *Apollo*, including security concerns. This time the threat is from Middle Eastern oil instead of Russian ICBMs. This time we are in an economic race for the jobs of the next century. What's more, we now face the greatest challenge ever faced by all of humankind at the same time—global warming.

Success will not involve instant gratification. Our forthcoming clean-energy revolution, like the original Apollo Project, will not be easy. It will not be instantaneous or without risk. Kennedy knew how to face such major challenges—with action. "All this," he said, "will not be finished in the first hundred days. Nor will it be finished in the first thousand days, nor in the life of this administration, nor even perhaps in our lifetime on this planet. But let us begin."³

Excerpted from *Apollo's Fire* by Jay Inslee and Bracken Hendricks. Copyright © 2007 by Island Press. Excerpted by permission of Island Press. All rights reserved. No part of this excerpt may be reproduced or reprinted without permission in writing from the publisher. Island Press grants permission to forward this unaltered electronic document to friends, colleagues, and other interested parties.

Please click [here](#) to return to the main table of contents



The ECO Guide to Careers that Make a Difference:
Environmental Work for a Sustainable World

The Environmental Careers Organization

Hardcover: \$34.95 | ISBN 1-55963-966-0

Paperback: \$19.95 | ISBN 1-55963-967-9

320 pages | 7 x 9 | Tables. Figures. Index.

A CONVERSATION WITH Eileen Claussen

Eileen Claussen, president of the Pew Center on Global Climate Change, is a leading voice for sensible action to address climate change—the most pressing global environmental problem of the twenty-first century.

“I am realistic about the challenges we face on this issue. There are still a small number of skeptical scientists and others who prefer to do nothing about climate change,” Claussen says. “And some of these people have loud megaphones. But I do not believe they will prevail. I believe strongly that there are many certainties in science; that there are many actions we can take with no negative economic impact; and that, with careful planning and continued technological development, we can address this problem and still grow the global economy. Which is precisely what we need to do.”

Before becoming president of the Pew Center, Claussen served as the Assistant Secretary of State for Oceans and International Environmental and Scientific Affairs. She also has served as Special Assistant to the President and Senior Director for Global Environmental Affairs at the National Security Council, and spent over twenty years at the U.S. Environmental Protection Agency. Claussen received her M.A. degree in English from the University of Virginia.

What Is the Issue?

The greenhouse effect is a naturally occurring process that warms our planet. In short, certain gases, like carbon dioxide (CO_2), methane (CH_4), and nitrous oxide (N_2O), act like the roof of a greenhouse—letting the sun's light in and trapping heat. Without the greenhouse effect, the earth would be approximately 60 degrees Fahrenheit colder. While most atmospheric greenhouse gases (GHGs) have both natural and anthropogenic (or human-induced) sources, anthropogenic activities—everything from industrial processes to fossil-fuel combustion to changes in land use, including deforestation—have significantly increased GHG emissions into the atmosphere. These emissions are upsetting the balance between natural GHG sources and natural sinks—processes that result in the net removal of GHGs from the atmosphere. As a result, more GHGs are being emitted than are being removed, and concentrations in the atmosphere are rising, trapping more heat and increasing temperatures.

Scientific records from global temperature readings over the last century leave no doubt that the earth is indeed warming. Surface temperatures have risen about 1 degree Fahrenheit since the late 1800s. The most recent estimates by the Intergovernmental Panel on Climate Change (IPCC), a United Nations body that draws on the expertise of hundreds of climate scientists around the world, indicate that, under a “business as usual” scenario, average global temperature will rise 2.5 to 10.4 degrees Fahrenheit (1.4 to 5.8 degrees Celsius) by the end of the twenty-first century. (See IPCC, *Climate Change 2001: The Scientific Basis*, for more details.) This is a significant change: the high end of this range is equal to the change in the average global temperature associated with the end of the planet's last ice age 10,000 years ago. But during that ice age it took thousands of years to reach this level of warming—not just one century.

The U.S. National Research Council of the National Academy of Sciences recently confirmed in a report to President George W. Bush the IPCC's finding that “greenhouse gases are accumulating in earth's atmosphere as a result of human activities, causing surface air temperature and subsurface ocean temperature to rise.” (See the National Research Council's full report, “Climate Change Science: An Analysis of Some Key Questions,” for more findings.) Potential consequences of this warming include sea-level rise and increases in the severity or frequency (or both) of extreme weather events, including heat waves, floods, and droughts, with potentially major impacts to U.S. water

resources, coastal development, infrastructure, agriculture, and ecological systems. The risks of these and other consequences are sufficient to justify action to significantly reduce GHG emissions.

Reducing GHG emissions is particularly difficult because no single country or industry is solely responsible for the problem. GHGs are emitted from a range of anthropogenic activities across all economic sectors and mix uniformly in the atmosphere, where they have long lifetimes. Simply put, a ton of GHGs emitted in the United States has the same impact on the climate as a ton emitted in Malaysia. This makes climate change a quintessential collective action problem—a global challenge that, in the long run, will require worldwide collaboration in order to avoid serious consequences. Nonetheless, the United States is responsible for about 25 percent of GHG concentrations in the atmosphere to date, so we have a special responsibility to lead the world in addressing the issue.

How Are Environmental Professionals Approaching the Issue?

A response to the global climate change challenge must begin now if it will be effective, and it must include both short- and long-term components. While an effective solution must be global, it is important that the United States be mindful of its unique role and responsibilities—both as the world's largest producer of GHGs and as a leader within the world community.

Establishing a clear path for GHG emissions reductions would begin this timely and efficient response. We can take certain steps now; for example, there are countless ways to use energy more efficiently and thereby reduce GHG emissions. Ultimately, we must fundamentally transform the way we power our homes, factories, and cars—in short, the way we power our entire economy. In this, we should remember the words of Eleanor Roosevelt: “The future is literally in our hands to mold as we like. But we cannot wait until tomorrow. Tomorrow is now.”

- **Creating an Alternative Energy Economy**

Current GHG emissions consist primarily of CO₂ from the combustion of fossil fuels in electricity generation, buildings, industrial processes, and transportation activities. To achieve the GHG emissions reductions necessary to address climate change, we must steadily reduce our dependence on fossil fuels and

BOX 5-1

ADDRESSING CLIMATE CHANGE

- Creating an Alternative Energy Economy
 - Designing and Implementing Public Policy
 - Understanding the Kyoto Protocol
 - Rethinking U.S. Climate Change Policy
 - Acting at the State and Local Level
 - Engaging Business and Industry
-

develop new energy sources that have fewer or no emissions in order to create an alternative energy economy that is more climate-friendly.

In the near term, increasing the use of natural gas in lieu of coal or oil can decrease GHG emissions, because natural gas is the least carbon-intensive of these fuels. Finding ways to capture and sequester, or remove, GHG emissions from the atmosphere—particularly from coal combustion—so that they are not released into the atmosphere can also help address climate change even as we find less carbon-intensive ways to produce energy. Researchers in the field of geochemical engineering are developing these technologies today, and a few pilot projects have begun. For example, American Electric Power has announced that its Mountaineer plant in West Virginia will be the site of a \$4.2 million carbon sequestration research project funded by the U.S. Department of Energy and a consortium of public- and private-sector participants. Projects like this are a start, but in the longer term, further development of renewable energy sources such as wind, solar, geothermal, hydrogen, and biomass could be critical to achieving the GHG reductions necessary to address climate change. For more information about alternative energy sources, see chapter 9 about energy.

The U.S. transportation sector is also heavily reliant on fossil fuels, currently accounting for one-third of U.S. CO₂ emissions. U.S. transportation produces more CO₂ emissions each year than any other nation's entire economy, except China. (See Green and Schaefer, *Reducing Greenhouse Gas Emissions from U.S. Transportation*, for more information.) Current vehicle trends contribute to the

emissions problem: many people are driving less efficient vehicles due to the increasing popularity of sport utility vehicles, and demand is growing for automobiles in developing countries where there are fewer vehicles. In this regard, **transportation planners** and analysts are challenged to find ways to provide people with mobility in climate-friendly ways.

In the near term, hybrid vehicles (where an internal combustion engine is complemented by an electric motor) can provide important gains in fuel economy. As reported in *Reducing Greenhouse Gas Emissions from U.S. Transportation*, by making the most effective use of both power sources, the advanced hybrid design in combination with a continuously variable transmission can improve fuel economy by 40 to 50 percent. Hybrid vehicles are already commercially available in the United States from Toyota and Honda, and other manufacturers like Ford, GM, and DaimlerChrysler have announced plans to introduce hybrids in the next few years. Due to the increasing popularity of this technology, the design and construction of new generations of hybrid vehicles is an up-and-coming professional niche among engineers in the automotive industry.

In the long term, fuel cell vehicles are a promising alternative to vehicles that run on petroleum. Emissions from hydrogen-powered fuel cell vehicles consist mainly of water vapor. However, in order to shift to fuel cell vehicles, we must overcome technological challenges like determining hydrogen sources. Hydrogen production from natural gas or coal (but only with CO₂ capture and sequestration) is a reasonable beginning, but ultimately renewables must become the source of hydrogen in order to significantly reduce the transportation system's carbon intensity. We would also have to establish the appropriate infrastructure to support hydrogen-fueled transportation and replace traditional gas stations, tanks, and pipelines. Despite these challenges, some manufacturers are now producing test fuel cell vehicles in order to advance this promising technology. To effect these important changes, research and development professionals' efforts must be complemented by business leaders who can help create supply and demand for climate-friendly products, practices, and markets. For more information about reducing emissions and efficient transportation, see chapter 9 on energy.

- Designing and Implementing Public Policy

Well-crafted international and domestic public policies are central to reducing GHG emissions effectively. Such policies cannot be well designed without input

from **climate change specialists**, who research both the causes and the consequences of those emissions. Because climate change is a global challenge that requires a global solution, policy experts—including **elected officials, lawyers, economists, environmental scientists, public policy analysts, lobbyists**, and international negotiators—must start with a full understanding of how the issue is being addressed internationally before they can design successful programs at home.

International efforts to address climate change began with the 1992 United Nations Framework Convention on Climate Change (UNFCCC), which set an ultimate objective of “stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system.” However, the voluntary emission reduction targets set by the UNFCCC were not sufficient and would not be met, leading to negotiation of the 1997 Kyoto Protocol.

- Understanding the Kyoto Protocol

The Kyoto Protocol is an international treaty that would establish binding emissions targets for industrialized countries and a range of mechanisms to encourage cost-effective compliance. The emissions targets for the period 2008–2012 average 5.2 percent below 1990 levels and range from 8 percent below (in the European Union) to 10 percent above (in Iceland). The U.S. target negotiated by the Clinton Administration is 7 percent below 1990 levels. The protocol will enter into force when ratified by at least fifty-five parties to the convention, including industrialized countries whose emissions account for at least 55 percent of the total CO₂ emissions in 1990 from that group.

President George W. Bush has made clear he will not submit the Kyoto Protocol to the U.S. Senate for ratification. Nevertheless, other countries continue to support the protocol and as of November 2003, 119 countries, accounting for 44.2 percent of global emissions, had ratified or acceded to the agreement. The European Union, for example, has implemented a CO₂ emissions trading scheme designed to help meet its Kyoto commitments. The remaining hurdle for the protocol is the 55 percent threshold mentioned earlier. If Russia should ratify the treaty, for example, this hurdle would be met and the Kyoto Protocol would go into effect even without U.S. ratification.

Implementing the Kyoto Protocol would be a strong signal to markets that GHG emissions come with costs and a declaration of multilateral will to con-

front this global challenge. But against that challenge, Kyoto would be only a first step. Whether or not Kyoto comes into force, we must begin to look beyond it. Several core challenges remain, such as establishing practical goals beyond the initial targets set by Kyoto, determining a fair way to include developing countries in climate change mitigation efforts, and ensuring that efforts to address climate change are as cost-effective as possible.

- **Rethinking U.S. Climate Change Policy**

As the world's largest economy and the world's largest GHG emitter, the United States is central to any long-term strategy to address global climate change. Voluntary efforts in a number of sectors over the past several years have failed to curb overall growth in U.S. GHG emissions, which rose roughly 12 percent over the past decade and are projected to continue rising for the foreseeable future. To be effective and affordable, a long-term emissions reduction program must couple mandatory GHG reductions with technology development and market mechanisms.

Ideally, a national strategy would be guided by a specific long-term emissions goal. It would also couple short- and long-term measures—and both supply and demand elements—to signal markets to begin the transition toward that ultimate objective. More specifically, short-term measures are needed to improve energy efficiency and encourage the use of lower-carbon fuels. Long-term measures are needed to encourage sustained investment in developing the technology and infrastructure needed to facilitate the transition to a low-carbon economy.

A domestic strategy ultimately must reflect our country's international commitments. However, its design and implementation should proceed now, even if the United States is not yet prepared to enter into an international agreement. As domestic and international programs evolve, close coordination between them is critical. This is especially important for companies that operate, compete, and sell products both domestically and abroad, as they will be subject to rules dealing with climate change in other countries. In addition, coordination is necessary to maximize the effectiveness of emissions trading and other flexibility mechanisms that are being developed at the international level.

Although the United States has not yet implemented a mandatory national climate change policy, interest in climate change proposals in the U.S. Congress

has increased. Members of both political parties are more willing to demonstrate their interest in climate protection. The number of climate change-related bills introduced has risen dramatically from seven in the 105th Congress (1997–1998) to over 80 in the 107th Congress (2001–2002). Perhaps most significantly, on October 30, 2003, the Senate voted on the Climate Stewardship Act (S.139), a bill crafted by Senators John McCain (R-AZ) and Joe Lieberman (D-CT). The bill couples strong environmental goals with a flexible market-based approach that allows business to reduce GHG emissions at the lowest possible cost. While the bill did not pass, the close vote (55–43) and debate that preceded it showed growing bipartisan support for real action against climate change. Advocates and **lobbyists** are working to produce an even better result the next time around.

- Acting at the State and Local Level

Despite the absence of a comprehensive climate policy at the national or international level, U.S. states and local communities are surprisingly active on this issue. States are able to address climate change through their authority over land use, transportation, utilities, taxation, and other policy areas affecting the environment. At the local level, cities are adopting climate change policies and engaging citizens with programs that encourage changing lighting practices or planting trees. Indeed, state and local efforts illustrate that climate change can be a bipartisan issue, an economic development opportunity, and an opportunity for policy entrepreneurship.

Twenty-seven states have developed or are developing strategies or action plans to reduce net GHG emissions. For example, New Jersey has committed to reduce GHG emissions to 3.5 percent below 1990 levels by 2005. New England governors signed an agreement in August 2001 with the Eastern Canadian premiers for a comprehensive Climate Action Plan that aims to reduce overall emissions and set targets on a regional level. New Hampshire, Massachusetts, and Oregon have set emissions requirements for power plants. Texas and Minnesota require that a specific amount of new electricity generating capacity be based on renewable energy. Furthermore, states are reducing agricultural and transportation sector emissions and promoting energy efficiency. However, it is important to note that state and local actions are not substitutes for comprehensive national or international approaches.

- Engaging Business and Industry

Business and industry must be engaged in shaping and implementing climate solutions because their operations are major sources of GHG emissions. Companies can demonstrate leadership by establishing and meeting emissions reduction objectives; investing in new, more efficient products, practices, and technologies; and supporting action to achieve cost-effective emissions reductions.

The Pew Center has identified more than forty companies, most either based in the United States or with significant U.S. operations, that have voluntarily committed to GHG reduction targets. British Petroleum, for example, has reduced GHG emissions to 10 percent below 1990 levels—eight years ahead of target—and now has pledged to keep them there at least until 2010. Alcoa is working to reduce its GHG emissions by 25 percent below 1990 levels by 2010. DuPont has achieved a 65 percent reduction below 1990 levels, well ahead of its 2010 target, and has pledged to hold emissions flat. (See Margolick and Russell, *Corporate Greenhouse Gas Reduction Targets*, for more details.)

The Pew Center recently studied several companies that have taken on targets and found they have multiple motivations. They believe the science of climate change is compelling. They know in time the public will demand strong climate protections, and they can get ahead of the curve by reducing their emissions now. They want to encourage government policies that will work well for business. They also want to improve their competitive position in the marketplace. And that, in fact, has been the result. Companies are finding that reducing emissions also helps improve operational efficiencies, reduces energy and production costs, and increases market share—all things that contribute to a healthier bottom line. While addressing climate change is not necessarily profitable, the evidence so far suggests it is certainly affordable.

Most companies have environment, health, and safety staff that work to implement such emissions reductions. Accountants and other financial professionals determine the costs and benefits of implementing such programs; mechanical and electrical engineers and technical professionals redesign projects, production processes, and operating procedures. Additional jobs are being created for brokers and auditors who will implement and evaluate GHG emissions trading programs. Many of these professionals work with public relations staff that communicate corporate-wide reduction strategies to the government, public, and company employees. As a growing number of companies

take steps to address climate change, job opportunities in these areas are likely to increase.

Career Advice from the Expert

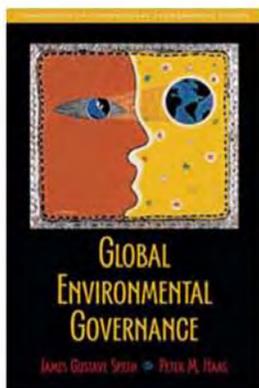
Climate change is a complex issue, and solutions and careers will originate in multiple sectors. Governments, businesses, advocacy organizations, international negotiators, scientists, economists, **journalists**, and many others will contribute to climate change policy and solutions. We need experts in all of these fields in order to design and implement emission reduction programs. While various actors approach the issue from different angles and with different expertise, they must all share a commitment to the issue and to finding solutions. Because this is a relatively new and multidisciplinary issue, there is no traditional educational path toward a career in addressing climate change.

The Pew Center employs **policy analysts**, scientists, economists, **lawyers** (both domestic and international), and communication professionals, and while each brings a skill set that is different, all contribute equally. My background in liberal arts provided writing, speaking, and analytical skills. These skills have served me well in various positions over the years. Because climate change is complex and cuts across virtually all sectors of society, cultivating the ability to think creatively, ask the right questions, and maintain an open mind is key. It's also helpful not to be intimidated by technical or scientific jargon or detail.

Solid education, job experience, and an ability to deal with complex issues are important for success working in this field. The capacity to persevere in the face of difficulty is, however, absolutely crucial. Addressing climate change essentially requires a new industrial revolution, one in which we transform the way we power our society. Even under the best of circumstances, when policy and politics are in alignment, this is not an easy task. What this task definitely requires is an ability to see small accomplishments for what they are: steps on the path to a sustainable future. Only optimists should apply for jobs in this field.

Excerpted from *The ECO Guide to Careers that Make a Difference* by The Environmental Careers Organization. Copyright © 2004 by Island Press. Excerpted by permission of Island Press. All rights reserved. No part of this excerpt may be reproduced or reprinted without permission in writing from the publisher. Island Press grants permission to forward this unaltered electronic document to friends, colleagues, and other interested parties.

Please click [here](#) to return to the main table of contents



Global Environmental Governance
Foundations of Contemporary Environmental
Studies Series

By: James Gustave Speth and Peter M. Haas

Hardcover: \$40.00 | ISBN 1-59726-080-0
Paperback: \$19.95 | ISBN 1-59726-081-9
192 pages | 6 x 9 | Tables. Figures. Text boxes.
Manuscript. Index.

Alternative Visions: How to Change the System

Many observers, including our neo-Malthusian bioenvironmentalists and the Social Greens, argue that in order seriously to address global environmental threats, deeper changes must be undertaken that address the underlying causes of such problems, though they do not all agree on what the root causes are. Some tend to see the causes of international environmental decline as deriving from structural factors having to do with economic

inequality, an absence of political representation, and undeveloped environmental sensibilities among the majority of the world's population.

Some of those urging these alternative approaches see them as important complements to environmental regimes; others see little hope for the regime approach and are disparaging regarding its prospects. In this section we review several of the alternatives that stress the need for progress in areas other than regimes and other international agreements.

Addressing the Underlying Drivers: Beyond Dealing with Symptoms

Three books by longtime observers of the global environmental scene appeared in 2003–2004, each reaching similar conclusions on a number of key issues. Lester Brown's *Plan B: Rescuing a Planet under Stress and a Civilization in Trouble*, Paul and Anne Ehrlich's *One with Nineveh: Politics, Consumption and the Human Future*, and Gus Speth's *Red Sky at Morning: America and the Crisis of the Global Environment* each contend that (1) global environmental conditions are steadily worsening, (2) current efforts to address them are inadequate, and (3) major new initiatives are needed, and these initiatives should address the underlying drivers of deterioration—the root causes. These works share many common elements regarding the identification of these drivers and what should be done about them, including similar views on four of the drivers: population and poverty, technology, consumption, and the current market system.

Here is Brown's *Plan B* on the imperative of action on population: "Early in this new century, the world is facing many long-standing social challenges, including hunger, illiteracy, and disease. If developing countries add nearly 3 billion people by mid-century, as projected, population growth will continue to undermine efforts to improve the human condition . . .

"As a species, our failure to control our numbers is taking a frightening toll. Slowing population growth is the key to eradicating poverty and its distressing symptoms, and conversely, eradicating poverty is the key to slowing population growth. With time running out, the urgency of moving simultaneously on both fronts seems clear.

"The challenge is to create quickly the social conditions that will accelerate the shift to smaller families. Among these conditions are universal education, good nutrition, and prevention of infectious diseases. We now have the knowledge and the resources to reach these goals. In an increasingly integrated world, we also have a vested interest in doing so."⁷

And Speth's *Red Sky at Morning* on the need for a new technology: "We urgently need a worldwide environmental revolution in technology—a rapid ecological modernization of industry and agriculture. The prescription is straightforward but challenging: the principal way to reduce pollution and resource consumption while achieving expected economic growth is to bring about a wholesale transformation in the technologies that today dominate manufacturing, energy, transportation, and agriculture. . . . The focus should be on 'dematerializing' the economy through a new generation of environmentally benign technologies that sharply reduce the consumption of natural resources and the generation of residual products per unit of economic output. The good news here is that across a wide front, technologies that would bring about a vast improvement are either available or soon can be."⁸

Speth goes on to provide an extensive list of newer technologies in renewable energy, precision energy use, hydrogen, fuel cells, automotive and light rail design, and so on.

And the Ehrlichs' plea for an end to rampant consumerism in *One With Nineveh*: "In the aggregate, there is abundant evidence that, once basic biological needs for food, shelter, clothing, and health care are met and a standard of living providing some leisure time and recreation is adopted, further consumption doesn't provide much increased satisfaction. The data for this are relatively unambiguous. In the United States, per capita real income (a surrogate for consumption) doubled between 1957 and 1992, but public opinion polls showed no increase in reported happiness. . . .

"There have been minor rebellions against rampant consumerism, as in the voluntary simplicity movement and phenomena such as green labeling (certification of an environmentally benign origin of products). And, perhaps most important, the negative environmental and social consequences related to unfettered American consumerism—suburban sprawl; deteriorating roads, bridges, and schools; degradation of national parks and forests; the growing gap between rich and poor—are increasingly being noticed."⁹

Speth's *Red Sky at Morning* stresses the need to make prices and market signals work for the environment: "We seek a market transition to a world in which market forces are harnessed to environmental ends, particularly by making prices reflect the full environmental costs. . . . Full-cost pricing is everywhere thwarted today by the failure of governments to eliminate environmentally perverse subsidies and to ensure that external environmental costs—including damages to public health, natural resources, and ecosystem

services—are captured in market prices. The corrective most needed now is environmentally honest prices.

“Environmental economists make a powerful case for full-cost pricing and have identified a variety of economic instruments that are available to move in this direction. They advocate securing property rights to overcome the ‘tragedy of the commons’ problem, tradable emission permits, pollution taxes, user fees, shifting subsidies from environmentally damaging activities to beneficial ones, and making polluters and others financially liable for the damages they cause.”¹⁰

The first step in taking action to curb the drivers of deterioration is for governments, NGOs, and business to decide that they must be addressed systematically. From that platform, finding the specific steps the international community can take, together or in loose concert, to reverse these drivers becomes possible. The ongoing efforts to achieve the United Nations Millennium Development Goals may be the best place to focus additional efforts on population and poverty. A good example of how the international community can come together to promote technology transformation is the German-led effort to promote international goals and cooperation for widespread use of wind and other renewable energy technologies. The shift to sustainable patterns of consumption would be furthered by an international agreement on ecolabeling and “product biographies.” Interestingly, a recent effort to “get the prices right” came from an unusual source when the WTO moved against U.S., European, and Japanese agricultural subsidies. A serious effort to reduce greenhouse gas emissions, such as that contemplated in the second phase of the Kyoto Protocol process, would also help move toward full-cost, environmentally honest pricing of energy.

Natural Capitalism: Beyond Blinkered Capitalism

In *Natural Capitalism*, Paul Hawken and Amory and Hunter Lovins do not reject capitalism; they merely seek to co-opt and green it. At one level, their prescriptions fit within the previous category of addressing the root causes of global environmental problems: they describe with extraordinary command the way new technology and technique can be put to good use by companies and governments. Similarly, they are clear that governments must intervene to make the market work for the environment rather than against it: “[N]atural capitalism does not aim to discard market economics, nor reject its valid and important principles or its powerful mechanisms. It does suggest that we should vigorously employ markets for their proper purpose

as a tool for solving the problems we face, while better understanding markets' boundaries and limitations.

“Many of the excesses of markets can be compensated for by steering their immense forces in more creative and constructive directions. What is required is diligence to understand when and where markets are dysfunctional or misapplied, and to choose the correct targeted actions to help them to operate better while retaining their vigor and vitality.

“For all their power and vitality, markets are only tools. They make a good servant but a bad master and a worse religion. They can be used to accomplish many important tasks, but they can't do everything, and it's a dangerous delusion to begin to believe that they can—especially when they threaten to replace ethics or politics.”¹¹

But *Natural Capitalism* also offers a radically new vision of how capitalism should work, backed by the hope that the business community, freed from the shackles of the past and empowered by this new vision, will become the principal vehicle for addressing many global environmental challenges. Hawken and the Lovinses see four central strategies toward natural capitalism:

- Radically increased resource productivity in order to slow resource depletion at one end of the value chain and to lower pollution at the other end.
- Redesigned industrial systems that mimic biological ones so that even the concept of wastes is progressively eliminated.
- An economy based on the provision of services rather than the purchase of goods.
- Reversal of worldwide resource deterioration and declines in ecosystem services through major new investments in regenerating natural capital.

Natural Capitalism envisions an extraordinary and hitherto largely unrealized role for business. “The success of resources productivity as a societal strategy may augur an entirely new relationship between business and government. . . . [Business] may need to take positions diametrically opposed to its prior stands and even argue for stricter regulation. . . . It will not be trivial to establish sensible policies. Emphasizing resource productivity will require reversal of two hundred years of policies in taxes, labor, industry and

trade, meant to encourage extraction, depletion and disposal. . . . In a few decades, historians may write a history of our times that goes something like this: Now that the private sector has taken its proper place as the main implementer of sustainable practices, simply because they work better and cost less, the 1970s and 1980s approach of micromanagement by intensive government regulation is only a bad memory.”¹²

Ecological Economics: Beyond Neoclassical Economics

In their 2004 textbook *Ecological Economics*, Herman Daly and Joshua Farley challenge customary thinking about the economy and economic growth: “More contentious (and more important) is the call by ecological economics for an end to growth. We define growth as an increase in throughput, which is the flow of natural resources from the environment, through the economy, and back to the environment as waste. It is a quantitative increase in the physical dimensions of the economy and/or of the waste stream produced by the economy. This kind of growth, of course, cannot continue indefinitely, as the Earth and its resources are not infinite. While growth must end, this in no way implies an end to development, which we define as qualitative change, realization of potential, evolution toward an improved, but not larger, structure or system—an increase in the quality of goods and services (where quality is measured by the ability to increase human well-being) provided by a given throughput. . . .

“Where conventional economics espouses growth forever, ecological economics envisions a steady-state economy at optimal scale. Each is logical within its own preanalytic vision, and each is absurd from the viewpoint of the other. The difference could not be more basic, more elementary, or more irreconcilable.”¹³

Daly and Farley believe we are now in a “full world” where “continued physical expansion of the economy threatens to impose unacceptable costs.” They note that the most binding constraint on economic growth may be the waste absorption capacity of the environment rather than resource depletion, long thought to be the likely constraint.

Over the past decade ecological economics has become an increasingly sophisticated analytical system. From the perspective of many of its practitioners, global environmental challenges are unlikely to be met successfully within the framework of neoclassical economics because this well-established system of economic thought recognizes only two of the three key factors—allocation and distribution—but not scale. Theoretically, for any given ecosys-

tem setting, there is an optimum scale of the economy beyond which physical growth in the economy starts costing more than it is worth in terms of human welfare. Practically, Daly and others might maintain we have reached or are past this point. They would see the solution to global environmental challenges in virgin materials taxes and charges on pollution, waste disposal and other environmental damage, and similar measures sufficient to begin to reduce “throughput,” the physical size of the economy. Such measures would increase sharply the productivity of natural resources and would be coupled with investments in regenerating the stock of natural capital.

Local Control: Beyond Corporate Globalization

If Hawken and the Lovinses see the possibility of an increasingly positive and constructive role for business, others doubt that global environmental challenges can be addressed unless much is done to curb corporate power and reshape the process of economic globalization now under way.

Much as ecological economics represents a direct challenge to what it sees as the inadequacies in neoclassical economics, the authors of *Alternatives to Economic Globalization: A Better World Is Possible* present a direct challenge to the ascendancy of what they call the “corporate globalists.” These authors, brought together by the International Forum on Globalization, are the intellectual leaders of what is often called the antiglobalization movement. Agree with them or disagree, they offer a coherent perspective on what is wrong, why the environment is under such threat, and what should be done about it.

Their assault, they acknowledge, is aimed squarely at the dominant structures of the modern economy and policy: “Since World War II, the driving forces behind economic globalization have been several hundred global corporations and banks that have increasingly woven webs of production, consumption, finance, and culture across borders. Indeed, most of what we eat, drink, wear, drive, and entertain ourselves with today are the products of global corporations.

“These corporations have been aided by global bureaucracies that have emerged over the last half-century, with the overall result being a concentration of economic and political power that is increasingly unaccountable to governments, people, or the planet and that undermines democracy, equity, and environmental sustainability. . . .

“Together these instruments are bringing about the most fundamental redesign of the planet’s social, economic, and political arrangements since

the Industrial Revolution. They are engineering a power shift of stunning proportions, moving real economic and political power away from national, state, and local governments and communities toward unprecedented centralization of power for global corporations, bankers, and the global bureaucracies they helped create, at the expense of national sovereignty, community control, democracy, diversity, and the natural world. . . .

“The first tenet of the globalization design is to give primary importance to the achievement of ever more rapid, never-ending corporate economic growth—hypergrowth—fueled by the constant search for access to new resources, new and cheaper labor sources, and new markets. . . . To achieve hypergrowth, the emphasis is on the ideological heart of the model—free trade—accompanied by deregulation of corporate activity. The idea is to remove as many impediments as possible to expanded corporate activity.”¹⁴

Environmental deterioration is placed unambiguously at the doorstep of these forces: “Economic globalization is intrinsically harmful to the environment because it is based on ever increasing consumption, exploitation of resources, and waste disposal problems. One of its primary features, export-oriented production, is especially damaging because it is responsible for increasing global transport activity, fossil fuel use, and refrigeration and packaging, while requiring very costly and ecologically damaging new infrastructures such as ports, airports, dams, canals, and so on.”¹⁵

Not much can be done about negative environmental trends, they argue, absent far-reaching changes in the way economic and political power is distributed in modern society. The antiglobalization critique, then, is fundamentally political: “The current and future well-being of humanity depends on transforming the relationships of power within and between societies toward more democratic and mutually accountable modes of managing human affairs that are self-organizing, power-sharing, and minimize the need for coercive central authority.”¹⁶

In response they offer a different vision: “The corporate globalists who meet in posh gatherings to chart the course of corporate globalization in the name of private profits, and the citizen movements that organize to thwart them in the name of democracy, are separated by deep differences in values, worldview, and definitions of progress. At times it seems that they must be living in wholly different worlds—which, in fact, in many respects they are. Understanding their differences is key to understanding the nature and implications of the profound choices humanity currently faces. . . .

“Citizen movements see a very different reality. Focused on people and the environment, they see the world in a crisis of such magnitude that it threatens the fabric of civilization and the survival of the species—a world of rapidly growing inequality, erosion of relationships of trust and caring, and failing planetary life support systems. Where corporate globalists see the spread of democracy and vibrant market economies, citizen movements see the power to govern shifting away from people and communities to financial speculators and global corporations replacing democracies of people with democracies of money, replacing self-organizing markets with centrally planned corporate economies, and replacing diverse cultures with cultures of greed and materialism.”¹⁷

Alternatives to Economic Globalization and similar critiques offer a daunting array of far-reaching policy and institutional changes: “At the dawn of the twenty-first century, the global corporation stands as the dominant institutional force at the center of human activity and the planet itself. . . . We must dramatically change the publicly traded, limited liability global corporation, just as previous generations set out to eliminate or control the monarchy. Any citizens’ agenda for transforming the global economy must be rooted in plans to solve this problem.”¹⁸

They offer a variety of proposals to reform corporate law and governance, assert stronger local control of multinational corporations, and end “corporate–state collusion.” They see the need for legislation aimed at three broad goals:

- *Where globalization has encouraged globe-spanning corporate concentration, the course must be reversed.* This can be done by giving priority to smaller businesses capable of functioning as human-scale communities of interest in which people know each other, are dedicated to a common purpose, and that rewards more equitably.
- *Where global corporations now enjoy complete mobility, businesses must be required to be rooted in a place.* They must be owned by people who have direct involvement in the operation—workers, community representatives, suppliers—rather than by distant investors who buy and sell without personal engagement other than profit, growth, and balance sheet figures.
- *All businesses must be transparent and accountable to all stakeholders in the community.* These people bear the ultimate impact of decisions

taken. They may include workers, environmentalists, public health officials, human rights activists, and the like. All have suffered from local activities controlled by distant owners.¹⁹

As one can see, those focused on curbing corporate power view the path ahead not so much one of creating countervailing power at the international level as one of assertive local control. In seeking to shift the bias away from the global to the local, they share the perspective of those advocates for change discussed next.

Bottom-up Change: Beyond Global Governance

Taking the slogan “Think Globally, Act Locally” to heart, a surprisingly diverse array of local organizations and communities are impatient with international processes and are of the view that the way forward is to “just do it” by working toward sustainability in everyday life and in local communities. The Center for a New American Dream, for example, envisions lifestyle changes attractive to some: “[T]he emergence of an alternative in farmers’ markets, worker cooperatives, healthy communities, land-use planning, socially responsible businesses, organic cotton, hybrid electric vehicles, barter networks, micro-enterprise, flexible work arrangements, simple living, reduced television watching, environmentally certified wood and fish, and a cultural renaissance of poetry, storytelling, dance, and reconnection to wild places. The new system is being built from the local level up.”²⁰

In *The Land That Could Be*, William Shutkin discusses what he calls “civic environmentalism” where members of particular geographic or political communities work together to build a future that is environmentally healthy and economically vibrant at the local and regional levels: “Civic environmentalism is the emerging model of social and environmental activism. It is a dynamic and transformative enterprise that moves beyond top-down, centralized law and regulation to planning and implementation at the community and regional levels. It embraces an ecosystem approach to social problem solving, with the environment as both a prime subject and a principal metaphor of civic action. Civic environmentalism does not just focus on specific media or pollutants, as traditional environmental regulation does. Rather, it focuses on the overall health and quality of life of communities—social, economic, and environmental—and the sustainability of that health and quality of life over time. Civic environmentalism links urban, suburban, and rural constituencies in the pursuit of shared goals and visions, and

enforces the notion that our fates are bound together by place and time.”²¹

In *Global Environmental Politics*, Ronnie Lipschutz searches the landscape for approaches to global environmental protection that might succeed. In most areas he sees severe limitations. “The practice of global environmental politics,” he writes, “must be centered elsewhere than the state system, international conferences, agencies, bureaucracies, and centers of corporate capital,” all of which he sees as part of the problem. And neither is he happy with mainstream environmental organizations: “But most historians of environmentalism agree that the 1960s marked some kind of watershed in the perception and treatment of the environment, one growing as much out of that decade’s tumultuous politics as from the evident damage to nature. Of the many social movements that emerged at that time, environmentalism has become most institutionalized and bureaucratized, the most normalized and mainstreamed, the most connected with ‘business as usual.’ Indeed, this absorption into the body politic has become something of an obstacle to the practice of environmental politics.”²²

Lipschutz suggests that “those activities that use mainstream methods to accomplish their goals have done little to change the institutions and practices that are the cause of environmental problems in the first place.”

In the end Lipschutz finds the wellspring of the new global environmental politics he seeks in action at the local level: “[E]nvironmental problems are, first and foremost, political and, therefore, about power. They have been caused through the exercise of various forms of power and, if they are to be dealt with, it will have to be through the exercise of other forms of power. To exercise such power, we must act collectively, in concert with others. Our actions must be political and have political purpose. We need to understand what politics is missing from our governing systems and restore those missing elements through a new environmental ethics and praxis. . . .

“[A]ctivists must still affect the beliefs and behaviors of real human beings, whose social relations are, for the most part, highly localized. Ideas do not fall from heaven or appear as light bulbs; they must resonate with conditions as experienced and understood by those real human beings, in the places that they live, work, and play. Moreover, it is in those local places that politics, activism, and social power are most intense and engages people most strongly.”²³

There are many ways individuals and communities can exert influence: as citizens and voters, as investors, as consumers, as association members, as workers, as activists, and as educators. In *Red Sky at Morning*, Gus Speth uses these roles to describe how local actions on these fronts can make a global

difference. “The biggest threat to our environment is global climate disruption, and the greatest problem in that context is America’s energy use and the policies that undergird it. . . . There is no riper target than the U.S. energy scene. And, indeed, the energy–climate problem provides the best example available of how citizen initiative and local action are beginning to address a global-scale problem. . . . We can imagine goals being set for renewable energy use and for reductions in greenhouse gas emissions by businesses and universities, by communities and states, then by groups of states and national associations and organizations of many types, all supported by worried insurers and institutional investors, to the point that local actions are indeed going to scale and changing the world. This is not a distant vision: it is a process that has already begun in the United States. We are not powerless to affect even the most remote and global challenges.”²⁴

★ ★ ★

This volume began with a thought experiment about planetary stewardship. Over the last 30 years, the international community’s actual quest for planetary stewardship has encompassed a variety of intergovernmental, governmental, and civil society initiatives. The results are mixed and generally conceded to be inadequate. The disturbing trends in deterioration continue. A much stronger system of environmental regimes is essential; that is also widely conceded. Those most deeply concerned have looked beyond regimes and asked what else must be done, as we saw in the preceding section.

Several themes run through these efforts to look beyond regimes for answers:

- The intergovernmental processes that constitute regimes are too closely allied with the forces that gave rise to the problems in the first place to produce real change.
- Real change is only possible if we address the deeper issue of the forces underlying deterioration.
- The search for these underlying drivers leads quickly to institutions and ideas of extraordinary power—the large multinational corporations and their influence on major governments, an unflagging commitment to high rates of economic growth, a consumerist and anthropocentric culture.
- Efforts to change this operating system in fundamental ways are essential, whether through wooing and conversion, creating of pow-

erful new incentives and disincentives, cutting its power centers down to size, or eroding its monopoly through community-based and other bottom-up initiatives.

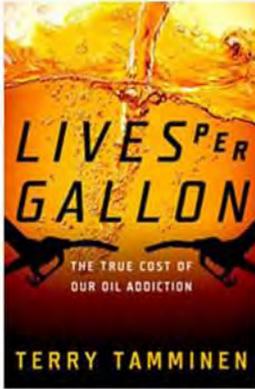
- None of this is likely unless civil society ascends to new prominence and new roles and engages in a new politics of the global environment. Indeed, explicitly or implicitly, almost all authors reviewed in the section on alternative visions call for a popular movement to drive the changes they see as necessary.

Integral to the transformations that are needed is a change in values—a transition to new habits of thought and a new consciousness captured well in the *Earth Charter*:

We stand at a critical moment in Earth's history, a time when humanity must choose its future. As the world becomes increasingly interdependent and fragile, the future at once holds great peril and great promise. To move forward we must recognize that in the midst of a magnificent diversity of cultures and life forms, we are one human family and one Earth community with a common destiny. We must join together to bring forth a sustainable global society founded on respect for nature, universal human rights, economic justice, and a culture of peace. Towards this end, it is imperative that we, the peoples of Earth, declare our responsibility to one another, to the greater community of life, and to future generations. . . . The spirit of human solidarity and kinship with all life is strengthened when we live with reverence for the mystery of being, gratitude for the gift of life, and humility regarding the human place in nature.²⁵

Excerpted from *Global Environmental Governance* by James Gustave Speth and Peter M. Haas. Copyright © 2006 by Island Press. Excerpted by permission of Island Press. All rights reserved. No part of this excerpt may be reproduced or reprinted without permission in writing from the publisher. Island Press grants permission to forward this unaltered electronic document to friends, colleagues, and other interested parties.

Please click [here](#) to return to the main table of contents



Lives Per Gallon: The True Cost of Our Oil Addiction

By: Terry Tamminen

Hardcover: \$24.95 | ISBN 1-59726-101-7
272 pages | 6 x 9 | Tables. Index.

— CHAPTER 8 —

The Quality of Mercy

The quality of mercy is not strain'd,
It droppeth as the gentle rain from heaven
Upon the place beneath: it is twice blest;
It blesseth him that gives and him that takes. . . .¹

Shakespeare, Merchant of Venice

Underlying Shakespeare's ode to justice, and the mercy that should guide it, is the notion of fairness. Is it fair that so many living things sacrifice physical, economic, and social well-being so that a few corporations and their shareholders might enjoy more financial wealth? Where is the justice in the Niger Delta? Where is the mercy in the impaired ability to breathe for millions of people harmed by the effects of preventable pollution?

Yes, we all use oil, directly or indirectly, and we all rely in many ways on engines that pollute, becoming unwilling participants in these injuries to ourselves, our neighbors, and our planet. The evi-

dence shows, however, that oil companies and automakers have made persistent efforts to obscure the facts about the true cost of their products from the public and government regulators that has prevented the scales of justice from balancing. It is a decades-long smokescreen that has obstructed the path to cleaner, safer, healthier alternatives, including the loss of mass transit from many of our cities, the result of corporate collusion that was proven in federal courts.

Adding insult to these injuries, the evidence presented thus far also indicates that oil and auto lobbyists have used their vast wealth to protect their corporations from paying for many of the externalities attributable to their products, including health-care costs, defense costs, damages to our food and water supply, and even the erosion of our national monuments. In 2005, the top ten oil and auto companies reported revenues of nearly \$2 trillion and profits of almost \$100 billion.² Although we must continue to advocate that these same corporations deliver alternatives that are less harmful, isn't it only fair that they should disgorge some of these considerable profits to mitigate the true costs of their past and present business model? Can there be "gentle rain" upon Earth instead of petroleum's black, harsh rain?

Like tobacco companies, which were sued by state attorneys general and which ultimately agreed to pay more than \$2 trillion to state governments over a twenty-five-year period to compensate taxpayers for public health-care costs and to fund anti-smoking campaigns, why shouldn't oil and auto companies "pay to play"?³ Why shouldn't they allocate a fraction of their kingly wealth to compensate taxpayers for health-care costs and the enormous expense of cleaning up their toxic legacy in our air, water, and landscapes? Many agree that they should, including at least one representative of these polluting industries.

"It's not aggressive enough," said Bob Wyman, an attorney for the Regulatory Flexibility Group, which represents Chevron, Texaco, Toyota, Reliant Energy, and Northrop Grumman, when

speaking about regulatory efforts to attain air quality standards in Southern California. “We’re running out of time. It’s time for the agencies to start thinking outside the box. We need to be more creative and use a different toolbox.”⁴

Because the \$2 trillion oil and auto industries are no more likely to offer compensation to their victims voluntarily than tobacco companies did, should tobacco-like litigation be one of the “creative” and “outside-the-box” solutions? Litigation may be an appropriate strategy on several levels. Like tobacco companies, the potential automakers and oil company defendants knew, or should have known, of the health effects related to their products and failed to take steps to reduce those harms. Instead, evidence shows that these corporations went to great lengths to prevent government regulators from reducing harms to the public, stalling improvements in CAFE regulations and undermining the California ZEV program, for example.

In 1953, scientists and doctors from Harvard Medical School, including the nation’s leading pulmonologists, presented findings based on years of research that detailed the lung damage caused by smog.⁵ In 1954, Los Angeles air pollution researchers concluded that smog was killing spinach, lettuce, and tomatoes grown in the region.⁶ In the years leading up to these revelations, California scientists had shown that vehicle exhaust was responsible for more than half of that pollution.⁷ Ironically, scientists had even reached the conclusion, as far back as 1939, that air pollution was severely damaging the leaves, and therefore the quality and yield, of one of the nation’s most valuable agricultural products, tobacco.⁸

In 1971, California state researchers Alfred C. Hexter and John R. Goldsmith published one of the first studies to quantify the cost of air pollution in terms of human life.⁹ They examined death records from a ten-day period of heavy smog in August 1955 and found 1,200 more deaths than normal for any comparable period. Death

certificates said “heart attack,” “heat stroke,” and “lung disease,” but the researchers concluded that the proximate cause was smog.

These few highlights, along with the detailed information presented in prior chapters, are just a few of the many persistent pieces of evidence that oil and auto companies ignored. How then might this problem be addressed in a courtroom? Let me start by saying that I am not a lawyer, but I have been a plaintiff in numerous successful lawsuits enforcing environmental laws against polluters, both as a citizen-activist and as secretary of California’s Environmental Protection Agency. When looking at the tobacco cases and other related environmental litigation, lawyers with whom I have worked over the years have suggested several courses of action that a state or individual plaintiff might consider in seeking redress of grievances against the oil and auto industries.

These concepts, however, are not merely legal theory. California, New York, and a dozen other state and city governments have already banded together to sue the federal government to regulate greenhouse gas emissions, such as CO₂, or give states the right to do so.¹⁰ Many of those same states have sued power plants for creating a nuisance by emitting tons of CO₂ each year, seeking payment of damages to state natural resources and termination of the pollution.¹¹ This growing coalition of state attorneys general is now looking at tobacco-like litigation against oil and auto companies for damages to natural resources, public health, and state treasuries.

Although these cases are making their way through the courts or are planned for future action, at least one adjudicated case suggests that this approach may yield results. In April 2002, a San Francisco jury found that gasoline with the additive MTBE is a “defective product” and the defendants—Shell Oil Co., Lyondell Chemical Co. (formerly Arco Chemical), Equilon Enterprises LLC, and Tosco Corp. (now part of Phillips Petroleum)—were fully aware of the additive’s risks and harms to the public. The jury found “clear and convincing evidence” that Shell and Lyondell had acted with

“malice,” in part because of a failure to warn the public about the potential harms from MTBE.

“As a resort community, Lake Tahoe has built a reputation on a pristine lake, clean air and pure water,” said Dennis Cocking, spokesman for the plaintiff, the South Tahoe Public Utilities District. “Who wants to save up their money and go on a vacation and drink water that tastes like paint thinner?”¹²

The oil and chemical companies settled that one case for \$69 million.¹³ Given the evidence already presented about the monetary damage to taxpayers at all levels of government, this case and others like it, along with the tobacco settlement model, suggest that there is a practical solution emerging to hold oil and auto companies accountable for the damages they have thus far forced others to subsidize. Here are a few causes of action that have been used or are under consideration to ultimately bring these companies as defendants before a judge and jury.

Public Nuisance

On February 22, 2006, a jury in Providence, Rhode Island, decided that three former lead paint manufacturers were guilty of creating a “public nuisance” with the lead in their products and that, although lead had been banned in the United States in 1978, the company continued to knowingly poison the state’s children. The companies could be held liable for millions of dollars in lead cleanup and mitigation costs.¹⁴

In North Carolina, the state’s attorney general sued the Tennessee Valley Authority and its eleven power plants in early 2006 for causing a “public nuisance” that causes respiratory illness in residents of the state, kills trees, fouls waterways, and leaves a haze over the Great Smoky Mountains. That lawsuit asks the court to mandate that pollution control devices be installed at the coal-fired power plants to prevent the spread of sulfur dioxide, nitrogen oxides, and mercury that create the nuisance.¹⁵

A “public nuisance” is an act or circumstance that interferes with the rights of the public to pursue or enjoy surroundings or community. Typical examples are a vicious dog that makes it difficult for you to use a sidewalk or access your front door; blocking a street; drug trafficking that makes your neighborhood dangerous or lowers property values; and fouling a common water supply, such as polluting the water supply for Lake Tahoe communities with MTBE.¹⁶

Does preventable air pollution interfere with the rights of the public? Legally, air pollution has constituted a public nuisance under a variety of circumstances, such as smoke from a factory or dust from a construction site that permeates your home. Since the passage of the federal Clean Air Act and other federal and state environmental laws, however, courts tend to defer to the regulatory systems delegated to the USEPA (and its state counterparts) that were established by these laws, saying that other courses of action are “preempted.”

One example of the preemption concept is currently being heard in federal court in relation to California’s landmark law to reduce greenhouse gases from cars and light trucks. Automakers have sued California to prevent implementation of the regulations under that law, which require new cars beginning in 2009 to lower greenhouse gas emissions by a third. The plaintiff automakers, supported by the Bush administration, claim that the state is trying to regulate fuel economy, not simply greenhouse gas emissions, and that fuel economy regulation is the sole province of the federal government. In other words, they claim that states are preempted from taking action on pollution that the federal government has reserved for its own rulemaking. Numerous cases have upheld the original intention of Congress, repeatedly stating that the purpose of the preemption provisions of the Clean Air Act is not to hamstring local efforts to reduce air pollution, but rather to prevent the burden on interstate commerce resulting from a multiplicity of conflicting state

and local exhaust emission standards.¹⁷ Moreover, not all pollutants or harms from oil and auto products are regulated by these laws. Carbon dioxide and other greenhouse gas emissions, for example, are not regulated by the federal government, and states are therefore free to impose their own restrictions.

Nuisance is an attractive legal theory because it does not require one to prove that the offensive act is illegal; rather, one needs merely to prove that it is taking place and causing a harm. Moreover, if an act is found to be a nuisance, it is subject to abatement, and, if a defendant's conduct is particularly egregious, plaintiffs may be entitled to punitive damages. For example, a jury might consider fumes from refineries, gasoline pumps, and tailpipes that cause illness and cancer to be an egregious nuisance. Unlike tobacco use, wherein smokers had the choice to stop smoking and nonsmokers can usually move away from secondhand smoke, none of us has the choice to avoid petroleum air pollution. Even children, who have never driven a car or otherwise contributed to air pollution personally, are harmed.

Fraud and Misrepresentation

In the tobacco litigation, addiction was the key. Courts were sympathetic to the plaintiffs' argument that tobacco companies had addicted consumers by manipulating the levels of nicotine in cigarettes to ensure continued consumption, which therefore increased illnesses and deaths.

In air pollution litigation, the practice of fraud and deceit that we have seen in previous chapters, including conspiracies that were proven in courts such as the National City Lines case, has economically addicted us. Our choices were taken away to further the goals of the oil and auto companies, including eliminating clean mass transit in forty-five cities, installing "defeat devices" on engines to bypass pollution controls, and stalling advancements in pollution prevention technology such as catalytic converters and zero

emission vehicles. Those actions have made us addicts even more so than smokers, given that smokers have the choice to quit, which is impractical for drivers.

The general definition of fraud is an intentional misrepresentation that seeks to make someone rely on false or misleading statements. The victim of fraud must in fact be harmed by relying on the false or misleading statements. The evidence presented thus far shows that oil and auto companies have known for a very long time that their products and processes are harmful to human health and the environment. It shows that safer, effective, affordable alternatives—or less harmful versions of their current products—exist. Despite this knowledge, these industries have represented to governments, to the public, and to consumers that their products are safe to human and environmental health and that no better alternatives or less harmful versions of their current products exist or could be affordably manufactured. Many of these practices were discussed earlier, but two examples stand out that seem ripe for litigation and compensation: the sale of high-octane gasolines and the sale of “defective” vehicles.

Octane Fraud

Recall that gasoline is generally sold in three grades, each with a different octane rating. The overwhelming majority of automobiles driven in the United States require gasoline with an octane rating of 87 or lower; for decades, however, petroleum companies have advertised and marketed to the public that the higher the octane rating, the better the car will operate and the cleaner the engine will become, and that these results will lead to reduced maintenance costs for the consumer. In fact, none of these representations is true for the overwhelming majority of cars.¹⁸

Nonetheless, the petroleum industry’s marketing and advertising campaigns have thus far succeeded in misleading the driving public. Study after study shows that consumers purchase more high-grade

and midgrade fuels than they can properly use. Even the *Oil & Gas Journal*, an industry publication, stated unequivocally that “octane demand is a situation forced on customers.”¹⁹ This situation is not a harmless status symbol, comparable with selling a \$50 belt when a \$5 belt will keep your pants in place equally well. Producing higher-octane fuel requires more energy, thus creating more refinery air and water pollution than would be needed for refining fuels of lower octane. Burning higher-octane fuels in engines that cannot do so efficiently actually results in increased engine deposits, which in turn make the vehicle operate less efficiently and therefore produce more pollution. All this pollution results in increased illness and premature deaths.

“A lot of consumers buy more expensive fuel on the mistaken belief it will enhance performance,” said Sean Comey, a spokesman for the Automobile Association of America. “They might as well throw the money out the window and burn it.”²⁰ Comey was equally unimpressed by automakers that “recommend” higher-octane fuels for luxury models. “If you shoot truth serum into the veins of car engineers,” he said dryly, “they’ll admit that ‘recommended’ means you don’t really need it.”

The cost of octane fraud is fairly easy to quantify based on the volume of high-octane fuels sold compared with the number of vehicles that actually need it. This cost could then form the basis for compensating victims.

Fraud and ICE

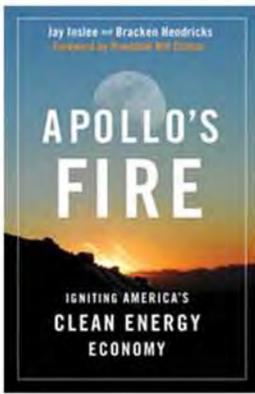
Another product that could be the subject of a fraud claim is the petroleum internal combustion engine itself. Based on misleading representations that the automobile industry has made to governmental regulatory and legislative bodies about the industry’s ability to make cleaner vehicles, the government has essentially protected the industry from regulations that would have otherwise forced them to make their products less polluting. Recall the evidence of

how the oil and auto companies undermined both the CAFE and ZEV regulations, which would have resulted in cleaner vehicle choices for consumers.

Consumers, in turn, have had no real choice but to purchase petroleum-powered ICE automobiles. For instance, even after manufacturing and selling popular battery-electric cars, automakers not only fought to terminate those models, but recalled and scrapped many that were already in service on the roads. Many states also have unfair business practices laws to address fraudulent corporate behavior, which allow plaintiffs to recover damages, including disgorgement of ill-gotten profits by the offending companies. California's Business and Professions Code (sections 17200 and 17500 specifically) prohibits business practices that are "unfair" or illegal, including advertising and marketing that is false or misleading. These laws permit citizens to file suit for such violations, and they have already been successfully enforced in environmental cases, for both monetary and injunctive relief (an order to stop the offending action). When I sued a major polluter of waterways in California in 1995, for example, the ironically named Ecology Auto Wrecking, we included this cause of action because the company had an unfair business advantage over competitors that were spending money to clean up their facilities and prevent such pollution from fouling local waterways. That case was settled before going to trial and Ecology implemented a wide variety of pollution prevention measures at its numerous locations.

Excerpted from *Lives Per Gallon* by Terry Tamminen. Copyright © 2006 by Island Press. Excerpted by permission of Island Press. All rights reserved. No part of this excerpt may be reproduced or reprinted without permission in writing from the publisher. Island Press grants permission to forward this unaltered electronic document to friends, colleagues, and other interested parties.

Please click [here](#) to return to the main table of contents



Apollo's Fire: Igniting America's Clean Energy Economy

By: Jay Inslee and Bracken Hendricks
Introduction by President Bill Clinton

Hardcover: \$25.95 | ISBN 1-59726-175-0
416 pages | 6 x 9 | Figures. Manuscript. Index.

A TALE OF TWO PRESIDENTS

Jay Inslee

In February 2007, both George W. Bush and Bill Clinton appeared at the Democratic House Caucus retreat at a conference center in Virginia and addressed global warming. On Friday night, President Clinton wowed the audience of three hundred by demonstrating both a passion for adopting a new energy future and a commanding comprehension of the technologies available to us. When I spoke with him after his speech, President Clinton pounded his fist to drive home his point: “There is only one thing we can do to create the jobs we need—create a new energy economy.” This was something clearly close to his heart, and I forgave him for stealing my speech.

The next morning I was tapped by Speaker Nancy Pelosi to address energy issues with President Bush at his meeting with the caucus. When I stood to ask my question, the president started to leave, but with caucus chairman Rahm Emanuel’s gentle insistence he took my question. Whether the Decider saw me coming and headed for safety or just wanted to get on his bike, I have only a suspicion.

Having let him put me off at our first meeting on global warming years earlier, I pulled no punches this time: “Good morning, Mr. President. This morning at breakfast with my son we saw a beautiful bald eagle just above the James River. It was there because years ago a president and a Congress acted upon clear scientific evidence to save this grand bird. But then I looked at the front page of the paper this morning, and it had a picture of starving polar bears on a melting iceberg, bears that will be extinct if we do not act. The other local paper reported that Hampton Roads, Virginia, would be partially

underwater this century if we do not act. Both papers reported on the unequivocal findings of the Intergovernmental Panel on Climate Change the day before.

“Some time ago I was encouraged when you and I conferred in the White House about global warming. You told me you knew you had a responsibility to act. You told me that you had the best minds in your administration working on a plan you would present. Well, Mr. President, that was six years ago, and I am still waiting. So is my son.

“We know what we have to do. We have to adopt a new Apollo type of energy project to use America’s huge innovative talent to solve this problem. Yet we are only investing one-half of what we were in the late 1970s in research. Your administration is just not doing the job.

“So, Mr. President, here is my question: When will you join us in capping CO₂ and building a new Apollo energy project so that my son, and my grandchildren, can enjoy the same bounty we do?”

I did not expect him to answer, “Tomorrow,” and he didn’t.

His answer was disappointing but not surprising, “We’ll do nuclear energy. It’s a renewable resource that gives off zero gas. Ethanol is going to be good, and cellulosic. I am putting money into these. But the rest of the world is putting out gas, too, and other countries haven’t done so well that signed onto the Kyoto Treaty. India and China haven’t done anything!”¹

In other words, he would help do something real about carbon when hell froze over. His finishing statement was the one that was beyond shocking: “You shouldn’t assume I don’t care about global warming as much as you do,” he said while placing his hand upon his Texas heart. “I care about global warming, I really do.”

In the spirit of unending optimism, I talked to President Bush again later that morning and explained to him that his work was fine as far as it went but told him, “You are spending a billion on clean coal, but nobody is going to ever use it as long as they get a free lunch—if there is no cost for sending carbon up the smokestack or no limit on the amount of total emissions. You have got to have a cap

to make it work.” At that, he had a glimmer of recognizing my point and said, “You mean they won’t be driven to it otherwise?” “Right,” I responded.

I asked for a chance to meet with him about this point, but he responded by drawing near me and saying, “Working that eagle in there was really good. That was really effective,” followed by the trademark snicker. Whether this president does not understand the magnitude of this threat or simply does not care is unknowable, but either way, our country deserves a response.

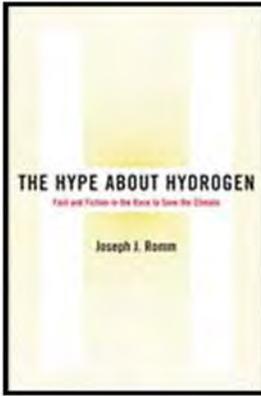
Afterward, one of my congressional colleagues made an astute observation: “He just has no vision on this. We won’t get any help from this president. It’s up to us.”

All of us.



Excerpted from *Apollo's Fire* by Jay Inslee and Bracken Hendricks. Copyright © 2007 by Island Press. Excerpted by permission of Island Press. All rights reserved. No part of this excerpt may be reproduced or reprinted without permission in writing from the publisher. Island Press grants permission to forward this unaltered electronic document to friends, colleagues, and other interested parties.

Please click [here](#) to return to the main table of contents



The Hype About Hydrogen: Fact and Fiction in the Race to Save the Climate

By: Joseph J. Romm

Hardcover: \$25.00 | ISBN 1-55963-703-X

Paperback: \$16.95 | ISBN 1-55963-704-8

256 pages | 6 x 9 | Manuscript. Index.

Choosing Our Future

This book has two primary themes. First, enabling the shift to a hydrogen economy may be one of the central tasks of the United States as we cope with the twenty-first century's major energy and environmental problems, especially global warming. Second, while widespread use of fuel cells for stationary power production seems likely post-2010, the transition to a transportation system based on hydrogen will take decades longer. Advances in technology alone will not prevent serious global warming nor deliver us to the Eden of a pollution-free hydrogen economy. Policy makers, businesses, and individuals all face tough choices.

We are close to the point at which even the best-case scenario for climate change will be fairly grim. Given the growing body of solid scientific evidence on global warming, and the remarkable consensus it has created in the scientific community, inaction during this decade is not mere procrastination. It represents a conscious choice to accept the risk of devastating and potentially irreversible climate change. We are in the doubly dangerous situation of facing global climate change that may be much more extreme and occur much more quickly than we expected just a few years ago. As the National Academy of Sciences explained in 2002, "the new paradigm of an abruptly changing climatic system has been well established by

research over the last decade, but this new thinking is little known and scarcely appreciated in the wider community of natural and social scientists and policy-makers.”¹

A key job of government is first to identify threats to our security and well-being—especially plausible worst-case scenarios with catastrophic outcomes—and then to take steps to nip them in the bud. I believe the primary reason why we should pursue fuel cells and a hydrogen economy is to help respond to global warming. Yet hydrogen is no panacea. In the next three decades, it offers little or no prospect of helping the United States reduce its greenhouse gas emissions. Hydrogen will contribute significant reductions by 2050 *only* if we dramatically change the energy path we are now on. And so my overarching recommendation is as follows.

Take a long-term, conservative perspective on hydrogen. Overhyping the potential of hydrogen fuel cell vehicles will not bring them to the market sooner. More likely, it will create a backlash that will slow their ultimate market success—an important lesson from our humbling experience in the 1990s trying to speed the use of alternative fuel vehicles. Rather, we need to let research and development (R&D) do its steady work and, we hope, make major breakthroughs in all the key technologies—hydrogen production, storage, and infrastructure, as well as fuel cells and carbon sequestration.

Hydrogen-related analysis should be conservative in nature, given both the projected investment that will be required—hundreds of billions of dollars—and the risks to the planet of waiting for a *deus ex machina* that may not be practical for decades. Analysts should state clearly what is technologically and commercially possible today and, when discussing the future, be equally clear that projections are speculative and will require both major advances in technology and major government intervention in the marketplace. Analysis should treat the likely competition fairly: If major advances in cost reduction and performance are projected for hydrogen technologies, similar advances must be projected for hybrid vehicles, renewable biofuels, and the like. If hydrogen is being presented as a solution to problems such as global warming

and dependence on imported oil, then the projected costs must be compared with those of the likely competition.

We also need to see that the likely avenue for the major introduction of fuel cells into the economy is, for the foreseeable future, *stationary* power production, including distributed generation running on natural gas. If carbon capture and storage (CCS) on a massive scale proves practical, then hydrogen could become a major energy carrier, but, again, it will most likely be used first for stationary power generation. The U.S. Department of Energy (DOE) has taken the position that it will not decide whether commercialization of fuel cell vehicles makes sense until 2015. Canadian engineer Geoffrey Ballard, founder of the leading proton exchange membrane (PEM) fuel cell company, said in June 2003, “The family-owned, garaged vehicle is the last vehicle that’s going to get a fuel cell. Fuel cells are still 30 times the cost of what they need to be for the automotive market.”²

We need continued expansion of R&D into key technologies. We also need pilot projects in order to gain practical experience with hydrogen-powered vehicles. In this country, pilots should be focused less on trying to speed early deployment of large numbers of fuel cell vehicles and more on trying to answer the key questions about storage, infrastructure, safety, and the like.

Most important, we need a variety of new government policies. A decade and a half of experience with countless *voluntary* emissions reduction programs run by the U.S. Environmental Protection Agency (EPA), the DOE, state governments, and nonprofit groups has proven that companies and individuals can reduce their pollution cost-effectively—but these voluntary programs have failed to stop the steady rise of U.S. greenhouse gas emissions. Only government action can reverse the growth of carbon dioxide (CO₂) emissions in order to buy time until hydrogen and other new technologies can help us reduce emissions sharply. And only government action can accelerate the development and deployment of greenhouse-gas-free power sources, which are key prerequisites for a hydrogen economy.

The following are specific strategies that can minimize the threat

of global warming and maximize the chance that hydrogen will contribute to that effort.

Sharply increase research and development into clean energy technologies. The longer we delay taking direct steps to reduce our greenhouse gas emissions, the more we are gambling the future of the planet on multiple technology breakthroughs in fuel cells, hydrogen production, hydrogen storage, renewable energy, carbon capture and storage, energy efficiency, and on and on. But if we're going to bet our future on technology, let's give ourselves the best chance of winning. A \$10 trillion economy with a \$600 billion per year energy bill, and more than 5 billion metric tons of CO₂ emissions every year, *must* spend far more than the billion or so dollars the federal government now devotes to clean energy R&D. The increases in federal hydrogen and fuel cell R&D since 2000 have been welcome, but they have come largely at the expense of R&D on energy efficiency and renewable energy technologies, an unwise policy. Technological luck comes at a high price; we must more than double our federal energy R&D budget as rapidly as possible.

Start reducing CO₂ emissions now using low-cost strategies. Delay does not reduce the cost of stabilizing CO₂ emissions.³ Quite the reverse. Delay increases costs for several reasons.

First, carbon-emitting products and facilities have a very long lifetime. Cars last 13 to 15 years. Coal plants can last 50 years. Commercial buildings and homes can last even longer. Replacing them is far more expensive than either building them smarter in the first place or, in the case of coal plants, not building most of them until we can minimize their emissions. Second, CO₂ lingers in the atmosphere, trapping heat, for more than a century. These twin facts create an urgency to avoid constructing another massive and long-lived generation of energy infrastructure that casts a carbon shadow into the 22ND century.

Third, as Prime Minister Tony Blair and Britain's Royal Commission on Environmental Pollution have said, we need to cut our emissions by more than 50 percent by 2050 in order to avoid a dan-

gerous doubling of atmospheric CO₂ concentration. If we allow U.S. emissions to rise unchecked for the next two decades, that target will almost certainly be unachievable, and whatever target we do set will require faster and deeper—and hence costlier—changes in our energy infrastructure.

For anyone interested in speeding up the transition to a hydrogen economy, it is critical we quickly put in place a number of policies that do not appear, at first, directly related to hydrogen. As discussed in Chapter 8, using natural gas to make hydrogen for use in transportation makes no sense at all from the perspective of reducing net U.S. greenhouse gas emissions. Using carbon-free sources of electricity—such as renewable power or nuclear power or carbon capture and storage at a coal plant—to make hydrogen for transportation will not make sense until the electric grid has shifted to virtually carbon-free power. On our current energy path, that is extremely unlikely before 2050. In other words, *to the extent that global warming becomes the dominant energy policy driver in the near future, it won't make much sense to invest major public or private resources to install a nationwide hydrogen fueling infrastructure and to commercialize hydrogen vehicles before mid-century—unless we quickly change our current high-CO₂ energy path.*

Two low-cost policies can jump-start this shift: a renewable portfolio standard (RPS) and a cap on CO₂ emissions in the electricity sector. An RPS that requires 20 percent of U.S. electricity to be renewable by 2020 has very little net cost to the country and the huge benefit of reducing future natural gas prices.⁴ Under such an RPS, electricity prices would be *lower* in 2020 than they are today, according to a 2001 study by the Energy Information Administration.⁵ Caps on electric utility emissions of sulfur dioxide, oxides of nitrogen, and mercury have been proposed by many policy makers because they will dramatically improve air quality and save the lives of tens of thousands of Americans. Analysis by the EPA has shown that a relatively modest additional cap on grid CO₂ emissions—returning to 2001 levels by 2013—would add a mere two-tenths of a penny per kilowatt-hour in 2020, about 3 percent of electricity costs.⁶

Neither of these low-cost policies would have a dramatic effect

on U.S. CO₂ emissions (and a tighter cap on carbon is certainly warranted). They would, however, do two vital things—get us off our unsustainable business-as-usual path and dramatically lower the cost of achieving the future deep reductions that are increasingly inevitable. They would also send a clear signal to the market that would spur significant investment in low-carbon technologies. Taken together these policies would accelerate the transition to a hydrogen economy by ten years or more. In particular, taking policy action this decade to set a carbon cap that kicks in during the next decade will be essential to spurring private sector investment in coal and biomass gasification as well as in carbon capture and storage. Such investment is essential if we are to launch a hydrogen economy before 2050, since the transition will not happen if the private sector cannot make money on it.

Begin a major national effort to encourage combined heat and power (CHP). To enable a hydrogen economy, we will need a fuel cell economy. How do we get there? The biggest potential market for stationary fuel cells is on-site cogeneration, or CHP. At the same time, CHP fueled by natural gas represents one of the lowest-cost strategies for reducing greenhouse gas emissions. Unfortunately, the barriers to rapid growth in CHP—and to all clean distributed generation technologies—remain high. The July 2000 report by the National Renewable Energy Laboratory discussed in Chapter 3 offered a “Ten-Point Action Plan for Reducing Barriers to Distributed Generation”:

1. Adopt uniform technical standards for interconnecting distributed power to the grid.
2. Adopt testing and certification procedures for interconnection equipment.
3. Accelerate development of distributed power control technology and systems.
4. Adopt standard commercial practices for any required utility review of interconnection.
5. Establish standard business terms for interconnection agreements.

6. Develop tools for utilities to assess the value and impact of distributed power at any point on the grid.
7. Develop new regulatory principles compatible with distributed power choices in both competitive and utility markets.
8. Adopt regulatory tariffs and utility incentives to fit the new distributed power model.
9. Establish expedited dispute resolution processes for distributed generation project proposals.
10. Define the conditions necessary for a right to interconnect.⁷

Launch a major national effort to use electricity and natural gas more efficiently. We need to slow the growth of CO₂ emissions, sharply reduce the need for new coal-fired power, and free up inefficiently used natural gas for high-efficiency power generation (either combined cycle plants or CHP). *Energy efficiency remains the single most cost-effective strategy for minimizing CO₂ emissions.*⁸

Most buildings and factories can cut electricity consumption by 25 percent or more with rapid payback (less than four years). My 1999 book *Cool Companies* relates some one hundred case studies of companies that have done just that and made a great deal of money.⁹ There are many reasons why most companies do not do what the best companies do, as explained in that book. The key point here is that we have more than two decades of experience with very successful state and federal energy efficiency programs. In short, we know what works.

Perhaps the most cost-effective federal strategy would be a matching program to co-fund state-based efficiency programs, with a special incentive to encourage states without an efficiency program to start one. This was a key recommendation of the Energy Future Coalition's End-Use Efficiency Working Group, a bipartisan effort to develop consensus policies in which I participated. Based on recent experience with state and utility efficiency programs, just \$1 billion in annual federal matching funds for five years would, by 2015, cut projected U.S. electricity use by about 5 percent, or about 225 million megawatt-hours per year.¹⁰ This policy would save consumers and businesses a whopping \$15 billion in

annual electricity bills. It would avoid the need for some 100 medium-sized (300 megawatt) power plants by 2015. *This simple strategy alone would avoid more than 100 million metric tons of CO₂ emissions per year.*

A natural gas efficiency strategy would be equally valuable. Again, most buildings and factories can cut natural gas consumption by 25 percent or more right now with rapid payback (less than four years). Removing barriers to CHP would be one element of this strategy. So would a major focus on more efficient use of steam. Steam is crucial for production in industries such as chemicals, food products, plastics, primary metals, pulp and paper, textiles, and petroleum refining. It is generated mainly by natural gas. Steam power represents a particularly large opportunity because it accounts for \$20 billion per year of U.S. manufacturing energy costs and 40 percent of U.S. industrial CO₂ emissions.¹¹ Expanding state and federal efforts to use steam efficiently, such as the DOE's Best Practices Steam Program, would cut those numbers sharply.

These efficiency strategies, coupled with an effort to expand CHP, will also make the electric grid more resilient and thus less likely to suffer power blackouts such as the massive one that hit the United States and Canada in August 2003.

Phase in CO₂-related standards for cars and light trucks. We should aim for at least a 25 percent reduction in CO₂ emissions per mile for new vehicles by 2020. Transportation is the fastest-growing sector in terms of greenhouse gas emissions, and it is almost exclusively responsible for our large and growing dependence on imported oil. Absent such standards, emissions and imports will grow dramatically in the next two decades. A renewable fuels standard would also accelerate market entry of zero-carbon fuels such as cellulosic ethanol and hydrogen. General Motors said in 2003 that the promise of hydrogen cars justified delaying fuel-efficiency regulations.¹² But as we have seen, hydrogen offers little or no prospect of reducing U.S. greenhouse gas emissions for at least the next three decades and thus must not be used as an excuse for inaction.

These policies would have little net cost to the country but would carry huge benefits in reducing pollution and accelerating new technologies into the marketplace. Many of them are likely to be adopted by leading states such as California and New York. Unfortunately, these policies currently lack political support at the national level, and a number have been roundly rejected by the United States Congress, the president, or both. This rejection represents the choice to live with more than a doubling of heat-trapping CO₂ concentrations over preindustrial levels, which brings me to my final recommendation.

Prepare the public for the tough choices ahead. We are very likely entering a multi-decade period in which the recent heat waves and weather extremes around the globe will seem mild by comparison. By the middle of this century, the temperature may well start rising by 1°F per decade. Most of the world's coral reefs and their rich ecosystems probably cannot be saved. We face very real risks of catastrophic change in ocean circulation and sea level. Yet, from my perspective, rather than drawing attention to the growing dangers, the government, the media, and the environmental community have, if anything, been underplaying the risk.

Consider an article published in the *New York Times* in July 2003, "Records Fall as Phoenix All but Redefines the Heat Wave," highlighting daytime temperatures of 117°F and nighttime temperatures of 96°F—"the hottest night in Phoenix history." The article never mentions even the possibility that global warming might be part of the explanation or that scientists expect such heat waves to become both more commonplace and more severe.

Or consider an article in the *Washington Post* from the same month, "Coastal Louisiana Drowning in Gulf: Encroaching Salt Water Is Threatening the State's Economy and Homes." The article discusses a variety of reasons why Louisiana annually loses more than twenty-five square miles of coastland to the Gulf of Mexico, such as efforts to control the flow of the Mississippi River, but it never mentions even the possibility that climate change has con-

tributed to the problem or that future sea level rise may undermine all efforts to find a long-term solution.

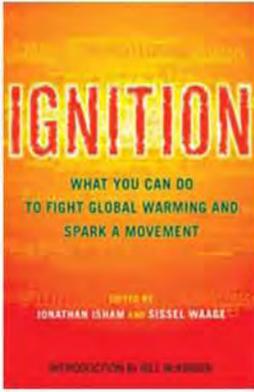
Such incomplete discussions leave the public ill prepared for what lies ahead and for what our nation will ultimately be called upon to do. Britain's Royal Commission on Environmental Pollution told Parliament in June 2000, "There is little public awareness or acceptance of the measures needed to accomplish sustained, deep reductions in greenhouse gas emissions."¹³ And this from a country that had already publicly committed to reduce its greenhouse gas emissions and to adopt many policies currently unacceptable to U.S. government policy makers.

The longer we wait to act, and the more inefficient, carbon-emitting infrastructure that we lock into place, the more expensive and the more onerous will be the burden on all segments of society when we finally do act. While there are a variety of low-cost emissions reduction strategies available to us today, there is no cost-free technical fix to global warming poised just over the horizon. Most particularly, if hydrogen fuel cell cars are going to have a major impact on the nation's fossil fuel consumption and greenhouse gas emissions, the U.S. government will have to intervene in the market for cars and fuels far more intrusively than anything that has ever been attempted in the past.

Historians may write admiringly of the foresight of those who helped enable a hydrogen economy. But if we fail to act during *this decade* to reduce greenhouse gas emissions—especially if we do so because we have bought into the hype about hydrogen's near-term prospects—historians will condemn us because we did not act when we had the facts to guide us, and they will most likely be living in a world with a much hotter and harsher climate than ours, one that has undergone an irreversible change for the worse.

Excerpted from *The Hype About Hydrogen* by Joseph J. Romm. Copyright © 2004 by Island Press. Excerpted by permission of Island Press. All rights reserved. No part of this excerpt may be reproduced or reprinted without permission in writing from the publisher. Island Press grants permission to forward this unaltered electronic document to friends, colleagues, and other interested parties.

Please click [here](#) to return to the main table of contents



Ignition: What You Can Do to Fight Global Warming and Spark a Movement

Edited by: Jonathan Isham and Sissel Waage
Introduction by Bill McKibben

Paperback: \$18.95 | ISBN 1-59726-156-4
304 pages | 6 x 9 | Figures. Index.

Afterword

JARED DUVAL

NATHAN WYETH

We have at most ten years—not ten years to decide upon action, but ten years to alter fundamentally the trajectory of global greenhouse emissions. . . . Such an outcome is still feasible in the case of global warming, but just barely.

Dr. James Hansen, director, NASA Goddard Institute for Space Science

We two, the authors of this afterword, are in our early twenties. We are of the generation that came of age on September 11, 2001. Yet the lesson our leaders told us they learned that day—that they would never again ignore a gathering threat to U.S. security—rings hollow when we reflect on the challenge of global warming. If anything, the lesson young people have learned is that when the fate of the world is truly at stake—from a problem that is so simple you can teach it to a second-grader—the president is going to call for more scientific studies, for baby steps, or will try to scare Americans into thinking that nothing can be done about it.

We believe, along with all the other authors of this book, that a moment of truth is now upon us. As stated by the country's preeminent climate scientist, NASA's James Hansen, global greenhouse gas emissions must peak and decline by 2015 or today's youth will be face life on a radically different planet than the one we now inhabit.¹ Our leading

scientists predict that this different planet would be marked by sea levels up to eighty feet higher than today, the extinction of up to 60 percent of species currently on this planet, and hundreds of millions of human refugees from drought and flooding of the coasts where over half of the world's population lives. Leading economists predict the costs to run into the trillions of dollars. Those are Great Depression numbers.

That, though, is not our world, nor does it have to be.

The year 2015 may seem like a distant deadline, but for global emissions to begin to decline then, the United States must take bold and urgent action now. The task will require massive effort from individuals, government, and corporations, a new New Deal on a national and global scale. As the generation that would face some of the worst consequences of a destabilized climate, we must work to ensure that the policy responses to global warming now being formulated by political leaders live up to this task. So far, most policy responses put forth in Congress do not live up to this. If solving global warming is approached merely as a technical matter rather than the moral challenge that it is, we fear that our political system will produce a lowest common denominator solution that might slow carbon emissions but would not solve the problem.

Think about it: to avoid a catastrophe in our generation, we need to start changing fundamentally the way the whole world produces and consumes energy in less than eight years. It took us nine years to put a man on the moon after President John F. Kennedy announced it as a national goal. This second Apollo project is larger and more profound in what it demands of us.

Yes, climate destabilization is probably the biggest danger that has ever faced humanity. Overcoming it may be our greatest challenge. Perhaps it is our youth, but we also see it as today's greatest opportunity for a better tomorrow.

Architect William McDonough said that "design is the manifestation of human intent."² An examination of today's energy economy, a fundamental aspect of our civilization, reveals little conscious design outside the interests of fossil fuel producers. Our intent is a society and energy economy in line with ecological precepts and reality, whose design will better provide for human needs. We see it as a chance to correct many unequal-

ities and right many wrongs. We just need to go back to the drawing board and be willing to think big.

We believe that we have the chance to put together a global compact that recognizes historical inequalities while setting countries on a path to correct them. We see technologies and change that will reinvigorate the U.S. economy, create cleaner air and healthier communities, and make clean energy available to world's citizens who today don't even have electricity. Climate protection solutions will free us from a national security strategy based on securing oil from the world's most dangerous and sometimes most oppressive places, and pull the rug out from under the despots who writer Thomas Friedman calls "petro-fascists." Clean energy development doesn't oppress and poison lower-income, largely minority communities in the way that fossil fuel production currently does. Together, we can create more just and sustainable ways of life that will not only protect the climate but also reinvigorate the wellsprings of human potential. As Thomas Paine reminded us during a trying time for the country, "the harder the conflict, the more glorious the triumph."³

As we go about the work of building a climate movement, we draw on visionary individuals and organizations from the twentieth century in the United States. We find inspiration in the civil rights movement, the clear moral choice laid down to the country at a time when a fundamental shift in society was needed. Today, a similar moral choice is needed about whether we base our society and economy on the logic of fossil fuels, or the logic of clean energy and sustainability.

We build our political strategy on the wisdom from David Brower, Sierra Club's first executive director and a founder of the modern environmental movement. He reminded us that "politicians are like weather vanes, our job is to make the wind blow."⁴

We draw strength from the ACT-UP! activists working against AIDS in the 1980s. After years of scientific evidence accumulating and thousands of unnecessary deaths, on an issue that challenged deeply held views in U.S. society, the Reagan Administration's response was tepid and ultimately inadequate. We know in hindsight that it failed to stem the worldwide crisis we see today. AIDS activists from ACT-UP! responded to inadequate policies with appropriate outrage, taking to the streets and

demanding a response commensurate with the threat. We see too many parallels between AIDS in the 1980s and global warming in the 1990s to ignore. We won't accept half measures during the coming critical decade.

We draw on John Kennedy's Apollo project of the 1960s for certainty that we can overcome this challenge with the promise of American ingenuity. We draw on Robert Kennedy's admonishment that "this world demands the qualities of youth: not a time of life or a state of mind, a temper of the will, a quality of imagination, a predominance of courage over timidity."⁵

The environmental movement has tried and failed for years to make the U.S. political system respond to this issue. From the inspiration above, however, we draw clarity for what we must demand and work for during the coming months and years. We must take a hard look at scientific reality and ecological need, take the moral road, and advocate for what is necessary: policies that will have emissions peak and decline by 2015 and reduced by 80 percent below 1990 levels by 2050. Given the increasingly clear consequences of global warming, we see no moral alternative. This clarity is necessary because, unlike almost every other issue on the political agenda, there actually is a *last chance* to avoid the destabilization of the climate. If we don't enact bold and comprehensive policy to cut our emissions now, the carbon we would emit until 2015 cannot be brought back down. As much as our generation would be willing to take action to stabilize the climate in twenty or thirty years, our ability to do so will have already been taken away from us.

A social movement based on moral values (which this movement must be) cannot win if the principle upon which it is based is compromised. If our future is in danger, a movement or a leader will have no credibility advocating for a policy that will simply slow carbon emissions and prolong the status quo rather than create a new clean energy economy.

We cannot wait for Washington. More than three hundred U.S. cities are taking local action to stop global warming. New Mexico has just become the twelfth state, joining California, New York, and others, in adopting clean car legislation that will dramatically reduce global warming pollution. In 2006, two U.S. campuses, the University of Florida and the College of the Atlantic, became the first to commit to climate neutrality: *no net carbon emissions*. Within a year, they have been followed by

commitments to work toward climate neutrality by the presidents of over 100 institutions of higher education, from community colleges to major state universities as part of the American College and University Presidents Climate Commitment. In addition, students at over five hundred high schools and colleges in the United States and Canada are working under the banner of the "Campus Climate Challenge" to call on their schools to set the emissions reductions goals demanded by science: 80 percent by 2050. Religious communities are responding to the call to preserve Creation, and have organized more than four thousand local showings of Al Gore's *An Inconvenient Truth*.

On the path to growing a movement that demands a moral choice from our political leaders and dramatic action in the immediate future, the march across Vermont in September of 2006 that culminated with more than a thousand citizens filling the streets in the state's largest city (as also detailed in Bill McKibben's introduction) was a dramatic first step and a preview of what is to come. What was remarkable about that five-day, fifty-mile trek was that it asserted the proper balance of power, with politicians responding to citizens, not the other way around. For too long, we've compromised our future by letting politicians tell us what they think is feasible. In Vermont, we told candidates for office what was demanded of them and they signed on. The two of us are now leading plans to replicate the Vermont march in states across the country, coming-out parties for the grassroots strength that has been built by local campaigns for clean energy at the church, campus, and city level.

Already, among the young people working on global warming can be found the rumblings of an approach that deploys tactics up to the task, such as sit-ins, fasts, and marches, and our generation must lead the charge. In fact, the first acts of civil disobedience have already happened: the 2006 spring semester at Penn State University culminated with a student sit-in at the university president's office advocating for a comprehensive global warming policy that will result in decrease of 80,000 metric tons of carbon emission by 2012.

The 2006 midterm election was the first one when stopping global warming made its way into the top ideas that progressive politicians advocated. Energy issues dominated campaign ads to an unprecedented degree,

and a Zogby poll indicated that among young people, and Latinos especially, global warming was a “sleeper issue” that helped clinch voters’ decisions.⁶

Beginning in 2007, students in early primary states will make the climate crisis a topic that every aspiring presidential candidate must address. In 2008, twenty years after the threat was first discussed on Capitol Hill, we will translate global warming into an issue that finally gains attention in presidential campaigns. We expect that the new U.S. president will enter the White House in 2009 ready to make climate change a national priority.

Far from being wary of such bold action, we believe that the U.S. public is waiting for this kind of leadership on global warming. According to a 2006 poll, 76 percent of Americans believe that it is “necessary to take steps to counter global warming’s effects right away,” and 81 percent of youth (ages 13 to 24) say the same thing.⁷ In some polls, young people have even ranked the environment as the most important problem their generation will have to deal with, ahead of the economy, education, health and diseases, and terrorism and war.⁸

We’ve learned, partly in frustration, partly by necessity, that the politics of half measures and division is not worthy of our generation. So tell us that revamping our approach to energy will be costly, and we’ll remind you that it will cost us far more to not do anything. Tell our generation that it will be a great challenge to redesign our energy economy, and we’ll tell you to look at our peers sent to patrol deadly streets in the Middle East and the marginalized communities most at risk from extreme weather. Look at the people losing their livelihoods because U.S. companies have fallen behind competitors in producing the most efficient technology possible. Look at the communities still suffering from the “traditional” externalities of fossil fuels, the smog, soot, and toxins that harm human health. In our experience, young people are ready to make the bold changes that can solve these problems.

When we think of the task before us, it is easy to be overwhelmed by the enormity of it all. Yet there are sources of inspiration. We are moved to act by our responsibility to the youngest or future generations, those who have the most to lose and the least ability to change our course. We can be moved by the more than ten thousand generations that have come before us. We can be driven by a faith in God, not daring to be held

responsible for destroying Creation. We can approach the clean energy solutions to global warming as a critical piece of creating the twenty-first-century resolutions to global poverty and oppression. We can be moved because we yearn to live up to our human potential. Sometimes we are moved simply by thinking about our childhood and the special natural places we've known and by the desire for our children to one day have the same opportunities. We can be moved by all these things.

The important thing is to join the movement. As Dr. Martin Luther King Jr. said, "There is an invisible book of life that faithfully records our vigilance or our neglect." During this time more than any other, we must err on the side of vigilance, and we must be unwavering in our dedication to make bold and inspirational solutions to global warming a defining act of our generation.

Excerpted from *Ignition* by Jonathan Isham and Sissel Waage. Copyright © 2007 by Island Press. Excerpted by permission of Island Press. All rights reserved. No part of this excerpt may be reproduced or reprinted without permission in writing from the publisher. Island Press grants permission to forward this unaltered electronic document to friends, colleagues, and other interested parties.

Please click [here](#) to return to the main table of contents