

# Hot, Flat, and Crowded

Why We Need a Green Revolution and How It Can Renew America

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## On car gas mileage, Page 16 & 17:

When the Clinton administration came into office, it looked into raising fuel economies standards further, just for light trucks. But to make sure there would be none of that, Congress, pressured by the Michigan congressional delegation-which is a wholly owned subsidiary of the Big Three automakers and the United Auto Workers-literally gagged and blindfolded the government when it came to improving mileage standards. Specifically, congress inserted an appropriation rider into the fiscal year 1996 - fiscal year 2001 Department of Transportation appropriations bill that expressly prohibited the use of appropriated funds for any rulemaking by the National Highway Traffic Safety Administration to tighten fuel economy standards for American cars and trucks-thereby freezing the whole process, Congress effectively banned the NHTSA from taking any steps to improve mileages standards for American cars!

This move blocked any mileage improvements until 2003, when the younger Bush's administration made a tiny adjustment upward in the mileage standard for light-duty trucks. In 2003, even China leaped ahead of the United States, announcing fuel economy standards" for new cars, vans and sport utility vehicles to get as much as two miles a gallon of fuel more in 2005 than the average required in the United States, and about five miles more in 2008" (*The New York Times*, November 18, 2001). Only in late 2007 - thirty-two years after Congress ordered mileage improved to 27.5 miles per gallon - did America once again act. It moved the U.S. fuel economy standard up to 35 miles per gallon - roughly where Europe and Japan are already - by 2020. That's twelve years away.

One result of all this nonsense, according to a study by the Pew Foundation, was that in America "the average car and truck sold at the end of the 1990's went about a mile less on each gallon of gas than it did 10 years earlier."

All this had a direct effect on our oil consumption-and on our foreign policy. According to Amory Lovins, the experimental physicist who heads the Rocky Mountain Institute, if the United States had continued into the 1990s to conserve oil at the rate it did in the period from 1976 to 1985, thanks in large part to the improved mileage standards, it would no longer have needed Persian Gulf oil after 1985." When Reagan rolled back CAFE standards, said Lovins, "it was the equivalent of 'un-discovering' one Arctic National Wildlife Refuge's worth of oil. It wasted as much oil as is believed to exist under the Refuge."

### Advantages of going Code Green, Page 174:

On top of it all, mounting a real revolution - going **Code Green** - is a “quintessentially American opportunity,” added Lois Quam. It plays to all our strengths. It requires enormous amounts of experimentation - the kind you find in our great research universities and national laboratories: it requires lots of start-up companies that are not afraid to try, risk, fail and try again, and plenty of venture capitalists ready to make big bets for big returns; it requires lots of teamwork and collaboration between business, government, and academe; it requires thousands of people working in their garages, trying thousands of things. And, most important, it is one of those national projects that is about big profits and big purposes; not just about making America richer, but the world better.

If those of us who have become concerned about climate change turn out to be wrong - but we refocus America anyway on producing clean electronics and the most energy-efficient vehicles, appliances, and buildings in the world, and we make America the global leader in aiding the protection of tropical forests and natural habitats, what is the worst that will happen? Our country will have cleaner air and water, more efficient products, more workers educated in the next great global industry, higher energy prices but lower bills, greater productivity, healthier people, and an export industry in clean power products that people across the world will want to buy - not to mention the respect and gratitude of more people around the world than ever. And we'll have to fight fewer wars over natural resources – because if the human race cannot create greater abundance, we will fight over everything that is in shortage, which is going to be a lot of things in a world that is hot, flat and crowded.

And what if the climate skeptics and deniers who say climate change is a hoax turn out to be wrong - but we listen to them and do nothing? What will happen? We will have a future full of droughts, floods, melting glaciers, rising sea levels, resource conflicts, massive disruptions along coastal areas all over the world, and, as the eco-consultant Rob Watson puts it, “the human race as a bad biological experiment on the planet.

This, in a nutshell, is why I believe we need to both redefine green and refocus America around a Code Green agenda - first and foremost because it would make America stronger, and, by giving it more options, would also make America freer in the era we're heading into.

But that is not the only reason. We also have a moral responsibility – because we consume the greatest portion per capita of the world's resources, because we have more resources for innovation than any other country, because we have the standing to affect more people on the planet than any other country, and because giving more people around the world the clean power tools they need is totally consistent with America’s mission to expand the frontiers of freedom for everyone. ....

..... If America doesn't seize this opportunity though," India, China, and others eventually will," argued Indian business leader, Ramalinga Raju. “Their solutions will

not be the best, because they will not be coming at the problem from the cutting edge of scientific and technological knowledge, and they will not go to scale as quickly, but they will be a lot better than nothing. Without the best architect, the brick and mortar carriers will learn to do their own designs. The house will take four years to build instead of two. There will be more mistakes. Less capital will be available. But it will get built, and once they get going, the replication process will take place every six months and [America] will not have a place in it. You will be watching.”

### **Energy Efficiency is the Key, Page 191:**

A study by the McKinsey Global Institute (February 2008) concluded that the world could cut projected global energy demand growth between now and 2020 "by at least half by capturing opportunities to increase energy productivity - the level of output we receive from the energy we consume." So much of this involves just being smarter about how we design buildings, packages, vehicles, refrigerators, air conditioners and lighting systems, and constantly insisting on higher and higher standards of efficiency from each of them - so we get the same comfort, mobility, and illumination from fewer resources.

### **The Fallacy of “205 Easy Ways to Go Green”, Page 209:**

*We're trying to change the climate system - to avoid the unmanageable and manage the unavoidable! .....* It doesn't get any bigger than this. This is not something you do as a hobby, and the adjective “easy” should never ever, ever accompany this task.

The truth is: Not only are there not 205 easy ways to *really go green*, there isn't *one easy way to really go green!* If we can pull this off, it will be the biggest single peacetime project humankind will have ever undertaken. Rare is the political leader anywhere in the world who will talk straight about the true size of this challenge.

### **The Largest Industrial Project in History, Page 212 & 213**

To convey the scale involved, Socolow and Pacala created a pie chart with fifteen different wedges. Some wedges represent carbon-free or carbon-diminishing power-generating technologies; other wedges represent efficiency programs that could conserve large amounts of energy and prevent CO<sub>2</sub> emissions. Socolow and Pacala argue that beginning today - right now - the world needs to deploy any eight of these fifteen wedges on a grand scale, or sufficient amounts of all fifteen, in order to generate enough clean power, conservation and energy efficiency to grow the world economy and still avoid the doubling of CO<sub>2</sub> in the atmosphere by mid-century.

Each of these wedges, when phased in over fifty years, would avoid the release of twenty-five billion tons of carbon, for a total of 200 billion tons of carbon avoided between now and mid-century, which is the amount that Pacala and Socolow believe would keep us below the doubling. To qualify as one of the fifteen wedges, though,

the technology must exist today and must be capable of large-scale deployment, and the emissions reductions it offers have to be measurable.

So now we have a target: We want to avoid the doubling of CO<sub>2</sub>, by mid-century, and to do it we need to avoid the emission of 200 billion tons of carbon as we grow between now and then. So let's get to the wedges. Choose your favorite "easy" eight:

- Double fuel efficiency of two billion cars from 30 miles per gallon to 60 mpg.
- Drive two billion cars only 5,000 miles per year rather than 10,000 at 30 miles per gallon.
- Raise efficiency at 1,600 large coal-fired plants from 40 to 60 percent.
- Replace 1,400 large coal-fired electric plants with natural-gas powered facilities.
- Install carbon capture and sequestration capacity at eight hundred large coal-fired plants, so that the CO<sub>2</sub> can be separated and stored underground.
- Install carbon capture and sequestration at new coal plants that would produce hydrogen for 1.5 billion hydrogen-powered vehicles.
- Install carbon capture and sequestration at 180 coal gasification plants.
- Add twice today's current global nuclear capacity to replace coal-based electricity.
- Increase wind power fortyfold to displace all coal-fired power.
- Increase solar power seven-hundred-fold to displace all coal fired power.
- Increase wind power eightyfold to make hydrogen for clean cars.
- Drive two billion cars on ethanol, using one-sixth of the world's cropland to grow the needed corn.
- Halt all cutting and burning of forests.
- Adopt conservation tillage, which emits much less CO<sub>2</sub> from the land, in all agricultural soils worldwide.
- Cut electricity use in homes, offices, and stores by 25 percent, and cut carbon emissions by the same amount.

If the world managed to take just one of those steps, it would be a miracle. Eight would be the miracle of miracles, but this is the scale of what will be required. "There has never been a deliberate industrial project in history as big as this," Pacala said. Through a combination of clean power technology and conservation", we have to get rid of 200 billion tons of carbon over the next fifty years-and still keep growing. It is possible to accomplish this if we start today. But every year that we delay, the job becomes more difficult. Because every year you delay, you have to do that much more the next year-and if we delay a decade or two, avoiding the doubling or more will become impossible."

### **Californian is benefiting from energy efficiency, Page 279**

According to the December 1, 2005, summary by the Hewlett Foundation,

“each Californian produces less than half the greenhouse-gas emissions as his or her fellow American. This is due in large part to state policies encouraging the use of natural gas and renewable resources over coal, as well as the aggressive promotion of energy efficiency. The state's per capita emissions have dropped nearly one-third since 1975, while the nation's per capita emissions have stayed flat. The study notes that each Californian typically saved about \$1,000 per year between 1975 and 1995 [on electricity bills], just through efficiency standards for buildings and appliances. Energy efficiency has helped the economy grow an extra 3 percent - a \$31 billion gain - compared to business as usual. The job growth created by the energy-efficiency industry will generate an \$8 billion payroll over the next twelve years.

What this implies, then, is if one wants to have an impact on the environment, the first and most important thing one can do is learn the rules around energy efficiency and emissions and how they get made.

### **The Least Expensive “Fifth Fuel”, Page 287**

Jim Rogers, CEO of Duke Energy, calls energy efficiency "the fifth fuel-after coal, gas, renewables, and nuclear." "When there is a fight in 2040 and 2050 for resources around the world," says Rogers, "our energy efficiency will allow us to maintain our standard of living and will allow us to continue to grow.

John Bryson, chairman and CEO of Edison International, the parent company of Southern California Edison, told me his company estimates that the average cost of saving a kilowatt-hour through efficiency is 1.7 cents per kilowatt-hour; the cost of generating any new kilowatt-hour of electricity today would be over 10 cents per kilowatt-hour-so the cost savings generated through energy efficiency are spectacular. Energy efficiency "is a business we want to be in," said Bryson.

### **How the Green Hawks are Out-greening Al-Qaeda, Page 321**

...When the army started looking at [the cost of fuel] holistically, it found that the fully burdened cost of delivering a gallon of fuel in the Iraqi military theater "was at least \$20 a gallon, and for many missions went upwards of hundreds of dollars per gallon for ground forces," explained Morehouse. Fuel delivered by airborne tanker aircraft actually costs the air force \$42 per gallon. That got people's attention.

The first initiative Nolan and his team focused on was improving energy efficiency. They worked with suppliers to develop a technique for the exterior insulation of tents. "We sprayed commercially available foam insulation on the outside of the tents, creating an air barrier capability to that structure, which lowered the requirements for air-conditioning by 40 to 75 percent," he explained. "You have

to get as much savings as you can at the front end from efficiency so the amount of renewable energy you have to generate at the back end is as little as possible and will go much farther. If I have a base that is demanding 2 megawatts of electricity every day, trying to provide all that with solar or wind or other alternatives is impossible. But if I can take the demand down through efficiency savings to 500 kilowatts a day, then my alternative energy can work."

### **1992 Earth Summit Speech by 12-Year Old, Page 395 & 396**

Up on the screen came a slightly grainy video from the 1992 Earth Summit in Rio de Janeiro, Brazil. A twelve-year-old girl from Canada named Severn Suzuki was addressing the plenary session of the Rio summit. The camera would occasionally pan to the audience of environment ministers from all over the world, who could be seen listening to her every word with rapt attention-as we did. Suzuki's speech is one of the most eloquent statements I have ever heard about both the strategic and the moral purpose of a real green revolution at the dawn of the Energy-Climate Era-from anyone of any age. It reads as well as it was delivered. Here is an excerpt:

Hello, I'm Severn Suzuki, speaking for ECO-the Environmental Children's Organization. We are a group of twelve- and thirteen-year-olds trying to make a difference: Vanessa Suttie, Morgan Geisler, Michelle Quigg and me. We raised all the money to come here five thousand miles to tell you adults you must change your ways.

Coming up here today, I have no hidden agenda. I am fighting for my future. Losing my future is not like losing an election or a few points on the stock market. I am hereto speak for all generations to come. I am here to speak on behalf of the starving children around the world whose cries go unheard. I am here to speak for the countless animals dying across this planet because they have nowhere left to go. I am afraid to go out in the sun now because of the holes in the ozone. I am afraid to breathe the air because I don't know what chemicals are in it.

I used to go fishing in Vancouver, my home, with my dad until just a few years ago we found the fish full of cancers. And now we hear of animals and plants going extinct every day-vanishing forever. In my life, I have dreamt of seeing the great herds of wild animals, jungles and rain forests full of birds and butterflies, but now I wonder if they will even exist for my children to see. Did you have to worry about these things when you were my age? All this is happening before our eyes and yet we act as if we have all the time we want and all the solutions. I' m only a child and I don't have all the solutions, but I want you to realize, neither do you . . . You don't know how to bring the salmon back up a dead stream. You don't know how to bring back an animal now extinct. And you can't bring back the forests that once grew where there is now desert. If you don't know how to fix it, please stop breaking it! . .

At school, even in kindergarten, you teach us how to behave in the world. You teach us: not to fight with others, to work things out, to respect others, to clean up our mess, not to hurt other creatures, to share - not be greedy. Then why do you go out and do the things you tell us not to do? Do not forget why you're attending these conferences, who you're doing this for - we are your own children. You are deciding what kind of world we are growing up in. Parents should be able to comfort their children by saying "everything's going to be all right," "it's not the end of the world," and "we're doing the best we can." But I don't think you can say that to us anymore. Are we even on your list of priorities?

My dad always says, "You are what you do, not what you say." Well, what you do makes me cry at night. You grown-ups say you love us, but I challenge you. Please make your actions reflect your words. Thank you.

### **Seeing the Huge Opportunity, Page 409**

That means creating a real "Department of Energy" to help shape a real green revolution. The main task of the current Department of Energy-most people don't realize-is watching over our nuclear weapons stockpile, not guiding a green revolution. We need a real Department of Energy that oversees all energy policy the way an effective Department of Defense oversees a war.

Aggregating all this power under one roof, and getting Congress and the states to go along, will not be easy, which is why we first need a president who can properly frame this challenge as an opportunity and an obligation. "If you view green as a cost, it is a failure," said Ramalinga Raju from Satyam, the Indian outsourcing giant. "If you view it as an ordinary investment, it is a failure. If you view it as an extraordinary investment that will bring transformational rewards and dramatic benefits, and therefore a huge opportunity, you will find success."