Cooling It! No Hair Shirt Solutions to Global Warming

By

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Dedication

Sometimes harsh criticism is an act of true friendship; this book is dedicated to all the new friends it will make me.

Acknowledgements

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Special thanks to Barry Commoner for writing "The Poverty of Power" – the seed of most work on eco-efficiency.

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A Real Fine Place to Start: Introduction

This is an optimistic book about a gloomy subject - the need to reduce fossil fuel use to fight global warming. It argues that we have technological substitutes available for oil, gas and coal **now** - at market prices comparable to those we currently pay. Neither cost nor technical barriers prevent drastic and speedy reductions in greenhouse emissions; slowing global warming is no longer a technical problem (if it ever was). It is structural, institutional, social, and political.

Why cover this particular topic? The carbon lobby[1] has mostly (not entirely) given up disputing that global warming is occurring. They know that they won't be able to confuse the public on its human-caused nature much longer. (~75% of the U.S. public understands global warming is a real problem[2]. If you are one of the remaining ~25%, please read the appendix **Hot Lies and Cold Facts**.) But a final stalling tactic is open to deniers - to pretend that nothing can be done, or at least nothing that most people are willing to live with. There is an old engineering saying: "no solution, no problem".

Converging with this, there is a small, but unfortunately influential primitivist movement. In their belief that technology itself is totalitarian, they also contribute to the idea that the only solution to global warming is a drastic reduction in the technical level of civilization - perhaps down to the hunter-gatherer level. Many well-meaning, intelligent people promote a less extreme version of this trope - the conviction that we need to impoverish working people in rich nations to solve our environmental crisis, and deal justly with the poorer countries.

The primary purpose of this book is to ensure that energy efficiency and renewable energy technologies become known as inexpensive fossil fuel substitutes available today, rather than a high priced vision of tomorrow. The U.S. needs to understand that continued use of fossil fuel is a political decision, rather than a technical one. It argues against the belief that the only choices are destructive, expensive, continued burning of fossil fuels, or dramatic cuts in the standard of living. It tries to accomplish this by gathering in one place information that has been widely scattered; it also tries to organize the information and clearly separate what we can do cheaply now, what we can do expensively now, and what we may be able to do in the future.

The argument that more and more global warming deniers will rely on is that it is too expensive to phase out most fossil fuel use.

There is a certain absurdity to spending the bulk of a book refuting the idea that saving the world is too expensive. But this absurd task is also a necessary one. If the methods offered to stop global warming are too costly or too unpleasant, many people will prefer to wait and hope that technology provides some magical painless solution.

Other popularizers have written about efficiency and renewables. This book differs in not assuming major technical breakthroughs, or drastic price drops in prices of existing technology; while these are both likely and desirable, we have cost-effective solutions available now.

Also what if the breakthroughs that are only six months away are still only six months away twenty years from now? It is not exactly unknown in the renewable energy field. This book will not argue against any of the "Gosh! Wow!" stuff; more serious R&D would probably produce exactly what many predict. But it seems urgent, absolutely essential to show that we can phase out most fossil fuels at an equal or lower cost than continuing to use them – even if there is no hydrogen path, no cheap solar cells, and no inexpensive carbon fiber.

Once that is done, the book will deal with R&D agendas - near term, long term and blue sky, but in the form of a sample research program, rather than a core requirement of the transition to a carbon neutral future.

To begin with, we need to explain how we can we make the switch at the same or lower prices than we pay now. Mostly, renewable energy costs more (at market prices) than fossil fuels.

No one uses kilowatts of electricity, or BTUs of heat, or gallons of gasoline for their own sake; energy provides service--comfort, cooked food, hot water and so on. If we can invest a tiny amount of money to drastically reduce energy needed to get the same results, more expensive renewable power can supply that reduced consumption at total cost comparable to what we spend now--including capital costs for increased efficiency. For example: we can inexpensively insulate a house so that it needs only a small portion of the heating and cooling energy of the average US home. Buy high-priced solar thermal panels to supply most of that remaining climate control demand, and we still have an overall heating/cooling bill less than before (including the cost of insulation). The bulk of the book will specify how to institute this type of efficiency in all areas - buildings, transportation and industry. We can reduce our energy consumption to a fraction of what we consume now, without reducing our standard of living, and then supply that fraction with small amounts of expensive renewable energy. Thus, renewable energy can supply all the services fossil fuel provides now – warm toes, cold beer, fast transportation--at a comparable cost. We will be dividing the money differently – more for capital expenditures, less for fuel and operating costs – but spend the same or a bit less than at present.

Through increased efficiency we can phase out a high percentage of fossil fuel use essentially for free. Again, energy is almost never consumed for its own sake. We use power to accomplish goals. If your new car can get you where you want to go as quickly, safely, and pleasurably as your old one, you don't mind that it runs of a battery charged by wind, generated in the U.S. rather than overseas.

(If we did not care about global warming, air pollution, and human health, this would not be our lowest priced alternative. Excluding such effects, it would be cheapest to install the least expensive of the efficiency and renewable measures, and use fossil fuels to supply most remaining needs. But we care how long we live, and how much of our lives we spend healthy rather than sick. Most of us would prefer to switch to renewable power at the same total price as we pay now for fossil fuels, rather than lower our energy bill and continue to use oil, coal and natural gas.)

The first chapter will document that almost our entire energy consuming infrastructure has a lifespan of thirty years or fewer. This is important to improving energy efficiency at low cost. If you have to replace a perfectly good (but inefficient) car with a new high mileage model, then the cost of that fuel saving is the entire cost of the car. But if you wait until you have a buy a new car in any case, then the prices of saving gas is only the difference between the cost of more and less efficient models. We will document that cost can be very low indeed.

The next two chapters will show that industrial infrastructure may be upgraded over the course of thirty years to use about 75% less energy per unit of output--at very little additional cost. They will cover Material Intensity, indirect savings through producing less intensive types of material goods. For example they will document construction methods that reduce consumption of metal, cement, lumber, plastic and other building materials; these save the energy needed to make metal, cement, lumber and plastic before one factory is made more efficient. Once this is covered for a variety of areas, direct savings through making factories more efficient are documented.

Similar savings will be documented in transportation, and on residential and commercial buildings.

A total savings chapter will total these percentage reductions, incorporating population growth projections and dealing with questions of per person economic growth as well. That will allow the projection of likely consumption in 2040 if efficiency measures are adapted – and calculate major additional savings in converting primary energy to useful power.

Right now a great deal of primary energy is used to produce an especially important form of secondary energy – electricity. Nearly three units of fossil fuel are burned for each unit of electricity delivered from fossil fuel plants. Total efficiency measures documented will provide a large enough absolute savings to allow all electricity to be produced via non-combustion sources – wind, hydroelectricity, geothermal, solar thermal and so forth. Thus, not having to burn fuel (either fossil or from renewable sources) to produce electricity will provide a significant additional savings.

The chapters on sources will provide much less detail than the efficiency sections – because the glamour of various renewable sources receives a great deal of publicity in any case. Instead they will focus on costs of large scale implementation, total resources available at that cost, and environmental consequences of deployment.

Chapters on electricity will deal with existing hydroelectricity, geothermal electricity, wind electricity, and solar thermal electricity. They will also cover storage for wind and solar thermal electricity. While some of these sources are comparable in price to that generated by fossil fuels, the total dollar figures including storage and expansion of the electric grid to make renewable electricity full available and fully dispatchable (there when you want it) will be significantly higher than the market price of fossil fuel generated electricity. This is why the main chapters dealt with efficiency; smaller amounts of more expensive electricity will provide the same services thanks to greater efficiency in using that electricity; total costs won't go up.

One area we will spend some time on is biomass (plant matter grown and harvested for fuel use). We won't drill down much into forms (biodiesel, ethanol and so forth); instead we will concentrate on how to sustainably grow enough biomass to convert. Producing usable fuel from biomass is not the primary challenge; sustainably growing enough biomass to run even greatly reduced demand by transport, industry and climate control without compromising food or fiber production is the more difficult challenge.

The final chapter hints at the economic, political, social and institutional barriers to implementing these solutions, and tentatively explores the politics of overcoming these barriers.

From here forward, this book will be fairly number-heavy. In Hollywood, when a plot starts dragging, writers often add a powerful visual image, to hang on to audience attention. At any time in the discussion, please feel free to mentally insert a butterfly-laden sunrise, a chase scene, or two girls kissing.

End Notes

[1] Fossil fuel companies, auto industry, many oil producing nations, and a variety of right wing think tanks.

The leading journalist covering this is Ross Gelbspan. In 1995, he was briefly fooled by dishonest work from "global warming skeptics" Pat Michaels, S. Fred Singer and Richard Lindzen; when a look at the actual science showed him he had been lied to, he was angry enough to write the book "The Heat is On" to expose both their junk science, and the cranks and liars behind it He has probably been the leading journalist exposing the carbon lobby since then, and has essentially given up the rest of his career to focus fulltime on the global warming and the carbon lobby.

Ross Gelbspan, *The Heat Is on: The Climate Crisis, the Cover-Up, the Prescription* (New York: Perseus Book Group,1997). (Still an excellent source for history of the Carbon Lobby.)

Ross Gelbspan, *Boiling Point: How Politicians, Big Oil and Coal, Journalists and Activists Have Fueled the Climate Crisis - and What We Can Do to Avert Disaster* (New York: Perseus Book Group - Basic Books, 2004). (Focuses more on his view of solution – but also brings Carbon Lobby history up to date.)

Ross Gelbspan, "Snowed,". *Mother Jones* May/Jun 2005, The Foundation for National Progress, 10/Jun/2005 <http://www.motherjones.com/news/feature/2005/05/snowed.html>. (Part of excellent May 2005 issue of Mother Jones, which contains a good survey of the current state of the Carbon Lobby.)

Another good source for current state of the Carbon Lobby is the Union of Concerned Scientists.
Union of Concerned Scientists, *Global Warming - Skeptic Organizations.* 2005, Union of Concerned Scientists, 30/Sep/2005 <http://www.ucsusa.org/global_warming/science/skeptic-organizations.html>.

To find out more about individual organizations, I recommend *SourceWatch* published online by The Center For Media and Democracy. You will that along with groups devoted primarily to global warming denial, much Carbon Lobby funding goes to general right wing groups that include it as one activity among many.

Center for Media and Democracy, *SourceWatch - SourceWatch.* SourceWatch Applies It's Standards to Itself - Reveals Own Funding Just as It Does Others, 2005, Center for Media and Democracy, 10/Jun/2005 <http://www.sourcewatch.org/index.php?title=SourceWatch>.

[2] Just about every public opinion survey by respectable sources shows about 75% of the public convinced that global warming is a real and serious problem, and about 25% convinced of the opposite or uncertain.

The Gallup poll for March 2005 shows nearly 80% of the population now believes human caused global warming is real.
Gallup Poll, *Environment: The Gallup Poll March 7-10 2005*. 01/07 2005, The Polling Report, 02/07/2005 << http://www.pollingreport.com/enviro.htm>>.

A series of public opinion polls regarding global warming compiled by the highly regarded Program on International Policy Attitudes:

"The Reality and Urgency of Global Warming," *Americans & the World,* Program on International Policy Attitudes - Jointly Established by the Center on Policy Attitudes (COPA) and the Center for International and Security Studies at Maryland (CISSM), School of Public Affairs, University of Maryland, 20/03 2005, 01/01/2005 <http://www.americans-world.org/digest/global_issues/global_warming/gw1.cfm>.

These include the following:

> In September 2002, 74% said they "believe the theory that increased carbon dioxide and other gases released into the atmosphere will, if unchecked, lead to global warming and an increase in average temperatures" "Majorities Continue to Believe in Global Warming and Support Kyoto Treaty", *The Harris Poll*, Harris Interactive #56 , October-23-2002 <http://www.harrisinteractive.com/harris_poll/index.asp?PID=335> ((January 2, 2005)
>
> --In March 2001, 64% said they "believe that emissions of gases like carbon dioxide are causing global temperature increases"; 23% did not (Time/CNN).
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> --In an August 2000 Harris poll, 72% said they "believe[d] the theory" of global warming, while 20% said they did not--up from December 1997 when in response to the same question 67% said they believed it and 21% said they did not.
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> --In a July 1999 NBC News/Wall Street Journal poll, only 11% took the position that "concern about global climate change is unwarranted."
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> --In a September 1998 Wirthlin poll, 74% embraced the belief that "global warming is real" even when the belief was defined in terms of global warming having "catastrophic consequences," while just 22% said they did not believe in it.
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> --An October 1997 Ohio State University survey asked about "the idea that the world's temperature may have been going up slowly over the last 100 years" and found that 77% thought "this has probably been happening," while 20% thought "it probably hasn't been happening." Likewise, 74% thought the world's average temperature would go up in the future, while 22% thought it would not.

The Pew Research Center for People and the Press, *Americans Support Action on Global Warming: Progress Seen On AIDS, Jobs, Crime and the Deficit.* 21/11 1997, 02/07/2005 <http://people-press.org/reports/display.php3?ReportID=100>.