

## ARTICLES

There's a huge gap between what is understood about global warming by the relevant scientific community and what is known about global warming by those who need to know: the public and policy-makers. We've had, in the past thirty years, one degree Fahrenheit of global warming. But there's another one degree Fahrenheit in the pipeline due to gases that are already in the atmosphere. And there's another one degree Fahrenheit in the pipeline because of the energy infrastructure now in place—for example, power plants and vehicles that we're not going to take off the road even if we decide that we're going to address this problem.

The Energy Department says that we're going to continue to put more and more CO<sub>2</sub> in the atmosphere each year—not just additional CO<sub>2</sub> but more than we put in the year before. If we do follow that path, *even for another ten years*, it guarantees that we will have dramatic climate changes that produce what I would call a different planet—one without sea ice in the Arctic; with worldwide, repeated coastal tragedies associated with storms and a continuously rising sea level; and with regional disruptions due to freshwater shortages and shifting climatic zones.

I've arrived at five recommendations for what should be done to address the problem. If Congress were to follow these recommendations, we could solve the problem. Interestingly, this is not a gloom-and-doom story. In fact, the things we need to do have many other benefits in terms of our economy, our national security, our energy independence and preserving the environment—preserving creation.

First, there should be a moratorium on building any more coal-fired power plants until we have the technology to capture and sequester the CO<sub>2</sub>. That technology is probably five or ten

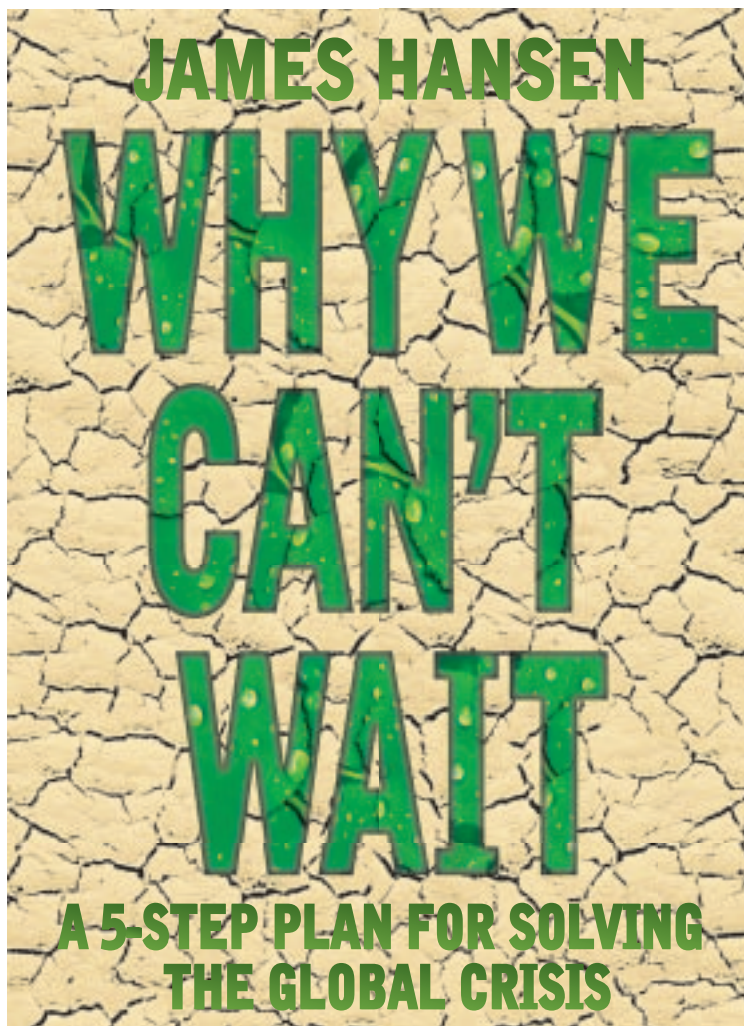
years away. It will become clear over the next ten years that coal-fired power plants that do not capture and sequester CO<sub>2</sub> are going to have to be bulldozed. That's the only way we can keep CO<sub>2</sub> from getting well into the dangerous level, because our consumption of oil and gas alone will take us close to the dangerous level. And oil and gas are such convenient fuels (and located in countries where we can't tell people not to mine them) that they surely will be used. So why build old-technology power plants if you're not going to be able to operate them over their lifetime, which is fifty or seventy-five years? It doesn't make sense. Besides,

there's so much potential in efficiency, we don't need new power plants if we take advantage of that.

Second, and this is the hard recommendation that no politician seems willing to stand up and say is necessary: The only way we are going to prevent having an amount of CO<sub>2</sub> that is far beyond the dangerous level is by putting a price on emissions. In order to avoid economic problems, it had better be a gradually rising price so that the consumer has the option to seek energy sources that reduce his requirement for how much fuel he needs. And that means we should be investing in energy efficiency and renewable energy technologies at the same time. The result would be high-tech, high-paid jobs. And it would be very good for our energy independence, our national security and our balance of payments.

But a price on carbon emissions is not enough, which brings us to the third

recommendation: We need energy-efficiency standards. That's been proven time and again. The biggest use of energy is in buildings, and the engineers and architects have said that they can readily reduce the energy requirement of new buildings by 50 percent. That goal has been endorsed by the US Conference of Mayors, but you can't do it on a city-by-city basis. You need national standards. The same goes for vehicle efficiency. We haven't had an improvement in vehicle efficiency in twenty-five or thirty years. And our national government is standing in court alongside the automobile manufacturers resisting what



*This is an adaptation of a talk delivered February 26 at the National Press Club by Dr. James Hansen, director of NASA's Goddard Institute for Space Studies. Comments relating to policy are Dr. Hansen's personal opinion and do not represent a NASA position.*

the National Research Council has said is readily achievable—a 30 percent improvement in vehicle efficiency, which California and other states want to adopt.

The fourth recommendation—and this is probably the easiest one—involves the question of ice-sheet stability. The old assumption that it takes thousands or tens of thousands of years for ice sheets to change is clearly wrong. The concern is that it's a very nonlinear process that could accelerate. The west Antarctic ice sheet in particular is very vulnerable. If it collapses, that could yield a sea-level rise of sixteen to nineteen feet, possibly on a time scale as short as a century or two.

The information on ice-sheet stability is so recent that the Intergovernmental Panel on Climate Change report does not adequately address it. The IPCC process is necessarily long and drawn out. But this problem with the stability of ice sheets is so critical that it really should be looked at by a panel of our best scientists. Congress should ask the National Academy of Sciences to do a study on this and report its conclusions in very plain language. The National Academy of Sciences was established by Abraham Lincoln for just this sort of purpose, and there's no reason we shouldn't use it that way.

The final recommendation concerns how we have gotten into this situation in which there is a gap between what the relevant scientific community understands and what the public and policy-makers know. A fundamental premise of democracy is that the public is informed and that they're honestly informed. There are at least two major ways in which this is

not happening. One of them is that the public affairs offices of the science agencies are staffed at the headquarters level by political appointees. While the public affairs workers at the centers are professionals who feel that their job is to translate the science into words the public can understand, unfortunately this doesn't seem to be the case for the political appointees at the highest levels. Another matter is Congressional testimony. I don't think the Framers of the Constitution expected that when a government employee—a technical government employee—reports to Congress, his testimony would have to be approved and edited by the White House first. But that is the way it works now. And frankly, I'm afraid it works that way whether it's a Democratic administration or a Republican one.

These problems are worse now than I've seen in my thirty years in government. But they're not new. I don't know anything in our Constitution that says that the executive branch should filter scientific information going to Congressional committees. Reform of communication practices is needed if our government is to function the way our Founders intended it to work.

The global warming problem has brought into focus an overall problem: the pervasive influence of special interests on the functioning of our government and on communications with the public. It seems to me that it will be difficult to solve the global warming problem until we have effective campaign finance reform, so that special interests no longer have such a big influence on policy-makers. ■

# Big Is Beautiful



## GREEN UTILITIES GROW, BUT NOT FAST ENOUGH.

BY CHRISTIAN PARENTI

**T**erry Hudgens is a classic oilman: thick drawl, square jaw, engineering degree from the University of Houston, twenty-five years with Texaco in the oil patch, which ended with his running the company's \$5 billion-a-year natural gas business.

These days Hudgens lives in Portland, Oregon, epicenter of organic coffee and politically correct unshavenness. To hear him talk, you could think he is wearing Birkenstocks: Instead of the good-old-boy discourse of the petroleum industry, Hudgens now speaks about "the power of the wind" and the future of clean energy.

But this is not the story of a midlife crisis, a businessman gone groovy at age 55. Instead, Hudgens has brought his hard-nosed oil-patch logic to the frontiers of renewable energy. He is now CEO of PPM Energy, a subsidiary of ScottishPower and America's second-largest and possibly fastest-growing wind

power company. He got into wind for the same reason he got into oil—it's a good way to make money.

"This is wind power on a grand scale," says Hudgens. He is talking about projects like Maple Ridge Wind Farm, the biggest power plant of any sort built in New York during 2006. The farm's 195 huge white wind turbines, with blades as long as jet wings perched atop tall steel towers, are spread across miles of ridgeline in Tug Hill, New York, catching steady airflow off the Great Lakes. On a good day this farm will produce 321 megawatts of power, as much as a midsize coal- or gas-fired plant.

The green future wasn't supposed to look like this. In the environmental imagination of the 1960s and '70s, the ecological ideal was something quaint, a village where every house had solar panels, a windmill and a vegetable garden where the lawn once soaked up pesticides. E.F. Schumacher told us that "small is beautiful," and to this day many environmentalists see large centralized systems as inherently bad.

But the speed and magnitude of climate change dictate that we begin the transformation away from carbon-based fuels now—and on a very large scale. Only a few decades remain if

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