Business Week
Aug. 16, 2004

The cover: Global Warming: Why Business is Taking it So Seriously.

The cover story: SPECIAL REPORT: GLOBAL WARMING
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Consensus is growing among scientists, governments, and business that they must act fast to combat climate change. This has already sparked efforts to limit CO[SUB 2] emissions. Many companies are now preparing for a carbon-constrained world.

The idea that the human species could alter something as huge and complex as the earth's climate was once the subject of an esoteric scientific debate. But now even attorneys general more used to battling corporate malfeasance are taking up the cause. On July 21, New York Attorney General Eliot Spitzer and lawyers from seven other states sued the nation's largest utility companies, demanding that they reduce emissions of the gases thought to be warming the earth. Warns Spitzer: "Global warming threatens our health, our economy, our natural resources, and our children's future. It is clear we must act."

The maneuvers of eight mostly Democratic AGs could be seen as a political attack. But their suit is only one tiny trumpet note in a growing bipartisan call to arms. "The facts are there," says Senator John McCain (R-Ariz.). "We have to educate our fellow citizens about climate change and the danger it poses to the world." In January, the European Union will impose mandatory caps on carbon dioxide and othergases that act like a greenhouse over the earth, and will begin a market-based system for buying and selling the right to emit carbon. By the end of the year, Russia may ratify the Kyoto Protocol, which makes CO[SUB 2] reductions mandatory among the 124 countries that have already accepted the accord. Some countries are leaping even further ahead. Britain has vowed to slash emissions by 60% by 2050. Climate change is a greater threat to the world than terrorism, argues Sir David King, chief science adviser to Prime Minister Tony Blair: "Delaying action for a decade, or even just years, is not a serious option."

There are naysayers. The Bush Administration flatly rejects Kyoto and mandatory curbs, arguing that such steps will cripple the economy. Better to develop new low-carbon technologies to solve problems if and when they appear, says Energy Secretary Spencer Abraham. And a small group of scientists still argues there is no danger. "We know how much the planet is going to warm," says the Cato Institute's Patrick J.

Michaels. "It is a small amount, and we can't do anything about it."

But the growing consensus among scientists and governments is that we can -- and must -- do something. Researchers under the auspices of the National Academy of Sciences and the Intergovernmental Panel on Climate Change (IPCC) have pondered the evidence and concluded that the earth is warming, that humans are probably the cause, and that the threat is real enough to warrant an immediate response. "There is no dispute that the temperature will rise. It will," says Donald Kennedy, editor-in-chief of Science. "The disagreement is how much."

Indeed, "there is a real potential for sudden and perhaps catastrophic change,"says Eileen Claussen, president of the Pew Center on Global Climate Change: "The fact that we are uncertain may actually be a reason to act sooner rather than later."

Plus, taking action brings a host of ancillary benefits. The main way to cut greenhouse-gas emissions is simply to burn less fossil fuel. Making cars and factories more energy-efficient and using alternative sources would make America less dependent on the Persian Gulf and sources of other imported oil. It would mean less pollution. And many companies that have cut emissions have discovered, often to their surprise, that it saves money and spurs development of innovative technologies. "It's impossible to find a company that has acted and has not found benefits," says Michael Northrop, co-creator of the Climate Group, a coalition of companies and governments set up to share such success stories.

That's why there has been a rush to fill the leadership vacuum left by Washington. "States have stepped up to fill this policy void, as much out of economic self-interest as fear of devastating climate changes," says Kenneth A. Colburn, executive director of Northeast States for Coordinated Air Use Management. Warning of flooded coasts and crippled industries, Massachusetts unveiled a plan in May to cut emissions by 10% by 2020. In June, California proposed 30% cuts in car emissions by 2015. Many other states are weighing similar actions.

Curbing Carbon

Remarkably, business is far ahead of Congress and the White House. SomeCEOs are already calling for once-unthinkable steps. "We accept thatthe science on global warming is overwhelming," says John W. Rowe, chairman and CEO of Exelon Corp. "There should be mandatory carbon constraints."

Exelon, of course, would likely benefit as the nation's largest

operator of commercial nuclear power plants. But many other companies also are planning for that future. American Electric Power Co. once fought the idea of combating climate change. But in the late 1990s, then-CEO E. Linn Draper Jr. pushed for a strategy shift at the No. 1 coal-burning utility -- preparing for limits instead of denying that global warming existed. It was a tough sell to management. Limits on carbon emissions threaten the whole idea of burning coal. But Draper prevailed. Why? "We felt it was inevitable that we were going to live in a carbon-constrained world," says Dale E. Heydlauff, AEP's senior vice-president for environmental affairs.

Now, AEP is trying to accumulate credits for cutting CO[SUB 2]. It's investing in renewable energy projects in Chile, retrofitting school buildings in Bulgaria for greater efficiency, and exploring ways to burn coal more cleanly. Scores of other companies are also taking action -- and seeing big benefits. DuPont has cut its greenhouse-gas emissions by 65% since 1990, saving hundreds of millions of dollars in the process. Alcoa Inc. is aiming at a 25% cut by 2010. General Electric Co. is anticipating growing markets for its wind power division and for more energy-efficient appliances. And General Motors Corp. is spending millions to develop hydrogen-powered cars that don't emit CO[SUB 2]. A low-carbon economy "could really change our industry," says Fred Sciance, manager of GM's global climate issues team. As Exelon knows, the need for carbon-free power could even mean a boost for advanced nuclear reactors, which produce electricity without any greenhouse-gas emissions.

Global warming could change other industries, too. Even if the world manages to make big cuts in emissions soon, the earth will still warm several more degrees in coming decades, most climate scientists believe. That could slash agricultural yields, raise sea levels, and bring more extreme weather.

For businesses, this presents threats -- and opportunities. Insurers may face more floods, storms, and other disasters. Farmers must adjust crops to changing climates. Companies that pioneer low-emission cars, clean coal-burning technology, and hardier crop plants -- or find cheap ways to slash emissions -- will take over from those that can't move as fast. "There is no silver bullet," says Chris Mottershead, distinguished adviser at BP PLC: "There is a suite of technologies that are required, and we need to unleash the talent inside business" to develop them.

Are we ready for this carbon-constrained, warming world? In some ways, yes. "There is a case to be made for cautious optimism, that we are making small steps," says BP's Mottershead.

Indeed, there is surprising consensus about the policies needed to spur innovation and fight global warming. The basic idea: mandatory reductions or taxes on carbon emissions, combined with a worldwide emissions-trading program. Here's how it could work: Imagine that each company in a particular sector is required to cut emissions by 20%. The company could meet the target on its own by becoming more energy efficient or by switching from fossil fuels to alternatives. But it could also simply buy the needed reductions on the open market from others who have already cut emissions more than required, and who thushave excess emissions to sell. Under a sophisticated worldwide carbon-trading system, governments and companies could also get sellable credits for planting trees to soak up carbon or for investing in, say, energy efficient and low-carbon technologies in the developing world. As a result, there is a powerful incentive for everyone to find the lowest-cost and most effective cuts -- and to move to lower-carbon technologies.

A key element is long-term predictability. If the world sets goals for the next 50 years, as Britain has done, and then implements the curbs or taxes needed to reach them, companies will figure out solutions. "Give us a date, tell us how much we need to cut, give us the flexibility to meet the goals, and we'll get it done," says Wayne H. Brunetti, CEO and chairman of Xcel Energy Inc., the nation's fourth-largest electricity and gas utility.

The Challenge

Such clear policy signals should bring major efficiency gains. Even 30% to 40% reductions in emissions by 2020 are possible, says Northrop. After that, he suggests, shifts to new energy technologies "can get the other 35% to 40% that we need to get to the low-carbon emission future."

The good news is that the world sees the threat and has begun to respond. The bad news is the magnitude of the task. Rising CO[SUB 2] levels in the atmosphere can't be slowed or reduced if only a few countries -- or even all the industrialized nations -- take action. The world must also figure out a way to permit growth in China, India, and other developing nations while lowering consumption of coal, gasoline, and other fossil fuels. "It's hard to think of a public policy issue that is harder than this one," says economist Jeffrey D. Sachs, director of Columbia University's Earth Institute.

Developing countries are responsible for just over one-third of the world's greenhouse-gas emissions. But they emit less than one-fifth as much per person as do the industrialized nations. That will increase as

their citizens buy more cars and consume more energy. By 2100, these countries will emit two or three times as much as the developed world, experts predict.

The Bush Administration and Congress have seized upon this issue as one reason for rejecting the Kyoto Protocol, which doesn't include the developing world. But international negotiators are beginning to talk about a plan that would go beyond Kyoto. The first step: showing that the industrialized world is serious about leading the way. That's one of the motivations behind Britain's vow to slash emissions by 60%, for example. Britain knows it can't solve this global problem by itself. But committing to reducing CO[SUB 2] "is the right thing to do," says British Energy Minister Stephen Timms. It will also keep the country from becoming dependent on foreign oil when its North Sea oil fields start to run dry in a few years.

The next step is to help the developing world adopt new technologies. China and other nations could avoid the West's era of gas-guzzlers and dirty power plants by jumping to highly efficient clean coal plants and hybrid or advanced diesel cars. What's needed, experts say, are incentives to stimulate companies to make investments in advanced technology in developing countries. Once an international carbon-trading system is put in place, suggests Elliot Diringer, director of international strategies at the Pew Center on Global Climate Change, "we can reduce our own costs in the U.S. by allowing our companies to get the benefit of low-cost emissions abroad."

Still, even if the developing world comes on board, staggering reductions in emissions are needed. Consider the math. For the past 450,000 years, the amount of carbon dioxide in the atmosphere has stayed below 290 parts per million (ppm). Now, we are spewing out more than 7 gigatons of carbon a year and large amounts of other greenhouse gases such as methane. As a result, the CO[SUB 2] levels in the air have climbed past 370 ppm. With no action, those levels could jump to 800 to 1,000 ppm by the end of the century. "We are already in dire straits," warns Columbia University geophysicist Klaus S. Lackner.

The Science

Can serious consequences be prevented? The British government, many scientists, and some executives are urging an all-out effort to keep the earth from warming more than two degrees Celsius. "The consequences of changes above two degrees are so dreadful that we need to avoid it," says BP's Mottershead. To hit that target, scientists calculate thatCO[SUB 2] concentrations in the atmosphere must be kept from reaching 550 ppm -- twice the preindustrial level. Getting there may

require cutting the world's per capita emissions in half by 2100.

Of course, there is great uncertainty surrounding the science of global warming. No one can really know the size and consequences of climate change. "Without a doubt, it will be a very different world -- a much warmer world," says David S. Battisti, atmospheric scientist at the University of Washington. But how much warmer? Which regions will be better or worse off? Will there be more floods and droughts? There's even a chance of surprises beyond the scary predictions of some computer models. "What's worrisome are the unknown unknowns," says Daniel P. Schrag, director of the Laboratory for Geochemical Oceanography at Harvard University. "We are performing an experiment that hasn't been done in millions of years, and no one knows exactly what's going to happen."

What scientists do know is that carbon dioxide and a number of other gases act like the roof of a greenhouse. Energy from the sun passes through easily. Some of the warmth that normally would be radiated back out to space is trapped, however, warming the planet. With no greenhouse gases at all in the atmosphere, we would freeze. The earth's average temperature would be a cold -17C, not the relatively balmy 14C it is today.

But the atmosphere is fiendishly complicated. If an increase in greenhouse gases also makes the sky cloudier, the added clouds may cool the surface enough to offset warming from CO[SUB 2]. Tiny particles from pollution also exert warming or cooling effects, depending on where they are in the atmosphere. Naysayers argue that it's just too soon to tell if greenhouse gases will significantly change the climate.

Yet the climate is changing. In the past 100 years, global temperatures are up 0.6 degrees Celsius. The past few decades are the warmest since people began keeping temperature records -- altering the face of the planet.

For instance, the Qori Kalis glacier in Peru is shrinking at a rate of 200 meters per year, 40 times as fast as in 1978. It's just one of hundreds of glaciers that are vanishing. Ice is disappearing from the Arctic Ocean and Greenland. More than a hundred species of animals have been spotted moving to cooler regions, and spring starts sooner for more than 200 others. "It's increasingly clear that even the modest warming today is having large effects on ecosystems," says ecologist Christopher B. Field of the Carnegie Institution. "The most compelling impact is the 10% decreasing yield of corn in the Midwest per degree [of warming.]"

More worrisome, scientists have learned from the past that seemingly small perturbations can cause the climate to swing rapidly and dramatically. Data from ice cores taken from Greenland and elsewhere reveal that parts of the planet cooled by 10 degrees Celsius in just a few decades about 12,700 years ago. Five thousand years ago, the Sahara region of Africa was transformed from a verdant lake-studded landscapelike Minnesota's to barren desert in just a few hundred years. The initial push -- a change in the earth's orbit -- was small and very gradual, says geochemist Peter B. deMenocal of Columbia University's Lamont-Doherty Earth Observatory. "But the climate response was very abrupt -- like flipping a switch."

The earth's history is full of such abrupt climate changes. Now many scientists fear that the current buildup of greenhouse gases could also flip a global switch. "To take a chance and say these abrupt changes won't occur in the future is sheer madness," says Wallace S. Broecker, earth scientist at Lamont-Doherty. "That's why it is absolutely foolhardy to let CO[SUB 2] go up to 600 or 800 ppm."

Indeed, Broecker has helped pinpoint one switch involving ocean currents that circulate heat and cold. If this so-called conveyor shuts down, the Gulf Stream stops bringing heat to Europe and the U.S. Northeast. This is not speculation. It has happened in the past, most recently 8,200 years ago.

Can it happen again? Maybe. A recent Pentagon report tells of a "plausible...though not the most likely" scenario, in which the conveyor shuts off. "Such abrupt climate change...could potentially destabilize the geopolitical environment, leading to skirmishes, battles, and even war," it warns.

There are already worrisome signs. The global conveyor is driven by cold, salty water in the Arctic, which sinks to the bottom and flows south. If the water isn't salty enough -- thus heavy enough -- to sink, the conveyor shuts down. Now, scientists are discovering that Arctic and North Atlantic waters are becoming fresher because of increased precipitation and melting. "Over the past four decades, the subpolar North Atlantic has become dramatically less salty, while the tropical oceans have become saltier," observed William B. Curry of the Woods Hole Oceanographic Institution in recent congressional testimony. "These salinity changes are unprecedented in the relatively short history of the science of oceanography."

If the global switch does flip, an Ice Age won't descend upon Europe, scientists now believe. But that doesn't mean the consequences won't be severe. The sobering lesson from the past is that the climate is a

temperamental beast. And now, with the atmosphere filling with greenhouse gases, "the future may have big surprises in store," says Harvard's Schrag.

In some scenarios, the ice on Greenland eventually melts, causing sea levels to rise 18 feet. Melt just the West Antarctic ice sheet as well, and sea levels jump another 18 feet. Currently shrinking glaciers may mean threats to water supplies for farmers and cities. Meanwhile, higher temperatures can cut crop yields, inhibit rice germination, and devastate biologically vital ecosystems like coral reefs. A paper in the July 16 issue of Science suggests that increasing CO[SUB 2] levels in the ocean could affect the growth of marine life, with consequences for the oceanic food chain.

Prevent or Adapt?

Perhaps the central debate in global warming now is not about the underlying science, but whether it's better -- and cheaper -- to take steps to prepare for or prevent climate change now, or to simply roll with the punches if and when it happens. Opponents of greenhouse-gas curbs say we should be able to adapt to a warmer world or even cool it back down. "I'm convinced there will be engineering schemes that will allow our children's children to have whatever climate they want," says Robert C. Balling Jr., a climatologist at Arizona State University and coauthor of The Satanic Gases, which argues that the worries are vastly overblown.

Yes, human beings can adapt, advocates of immediate action retort. But why run even the small risk of catastrophic changes, when important steps can be taken at a modest cost now? A British government panel, for instance, concluded that the cost of its share of the task of limiting the level of CO[SUB 2] to 550 ppm would be about 1% of Britain's gross domestic product.

Compare that, says Sir David King, with the cost of a single flood breaking through the barrier in the Thames River -- some 30 billion pounds, or 2% of current GDP. "Common sense says that it's time to purchase some low-cost insurance now," says economist Paul R. Portney, president of Resources for the Future.

The Business Response

When CEOs contemplate global warming, they see something they dread: uncertainty. There's uncertainty about what regulations they will have to meet and about how much the climate will change -- and uncertainty itself poses challenges. Insurance giant Swiss Re sees a threat to its

entire industry. The reason: Insurers know how to write policies for every conceivable hazard based on exhaustive study of the past. If floods typically occur in a city every 20 years or so, then it's a good bet the trend will continue into the future. Global warming throws all that historical data out the window. One of the predicted consequences of higher greenhouse-gas levels, for instance, is more variable weather. Even a heat wave like the one that gripped Britain in 1995 led to losses of 1.5 billion pounds, Swiss Re calculates. So an increase in droughts, floods, and other events "could be financially devastating," says Christopher Walker, a Swiss Re greenhouse-gas expert.

That's why Swiss Re has been pressing companies to plan for possible effects of warming. Lenders may require beefed-up flood insurance before issuing mortgages. Chipmakers must find replacements for greenhouse-gas solvents. Utilities need to prepare grids to handle bigger loads and to boost power from renewable sources. Oil companies need to think about a future where cars use less gas -- or switch to hydrogen.

Swiss Re says the word is getting out, but not fast enough. In a recent survey, "80% of CEOs said that climate change was a potential risk, but only 40% were doing something about it," says Walker. "That's not good to hear for insurers."

Shareholders are also demanding that companies assess the risks of global warming and devise coping strategies. Moreover, multinationals have no choice but to plan for emissions cuts because of the coming EU carbon limits and possible restrictions on other greenhouse gases.

Intel Corp., for example, is worried the EU could ban the use of perfluorocarbons (PCF), chemicals used in chipmaking that are potent greenhouse gases. "We are looking for substitutes but don't have any yet," says Intel's Stephen Harper. "We decided to craft a worldwide agreement to reduce PFC emissions 10% by 2010 -- upwards of a 90% reduction per chip. We wanted to show leadership and not have the EU regulate us."

Utilities face the greatest threat since the bulk of the power they generate comes from climate-changing fossil fuels. That's why AEP, Cinergy Corp., and others are probing new technologies that would enable them to capture the carbon as coal is burned. That carbon could then be pumped deep into the ground to be stored for thousands of years. AEP has helped drill a test well in West Virginia to see if this sort of "carbon sequestration" is feasible and safe. And dozens of utilities are turning to alternative fuels, from wind to biomass. Florida Power & Light Co. now has 42 wind power facilities and has

pushed energy efficiency, reducing emissions and eliminating the need to build 10 midsize power plants, according to Randall R. LaBauve, vice-president for environmental services. "We are seeing more companies committed to voluntary or even mandatory reductions," he says. Renewable energy, not counting hydropower, now produces only 2% of the nation's electricity. But some states -- along with Presidential candidate John Kerry -- are proposing that this be increased to as high as 20%.

Who Will Lead?

Even without mandates, scores of companies are taking concrete actions. "The science debate goes on, but we know enough to move now," explains AEP Chief Executive Michael G. Morris. It helps that thwarting global warming often brings cost savings and business benefits. Indeed, one goal of the newly formed Climate Group is to share tales of how climate strategies helped the bottom line. "The ones who have been at it for a while are finding they can do more than is asked for in Kyoto, and are achieving all kinds of benefits," says Northrop. BP, for instance, developed its own internal strategy for trading carbon emissions. That prompted a companywide search to find the lowest-cost reductions. Many of the measures were simple, such as identifying and plugging leaks. The overall result: a 10% reduction in emissions and a $650 million boost to the company in three years.

Climate-savvy execs are hoping that when carbon limits are imposed, they'll get credit for actions already taken. But they're also anticipating big future opportunities. GE bought Enron Corp.'s wind business and a solar energy company in addition to doing research on hydrogen and lower-emission jet engines and locomotives. "We can help our customers meet the challenges they are going to face," says Stephen D. Ramsey, GE's environmental chief. In Arizona, startup Global Research Technologies LLC is developing systems that use solvents to grab CO[SUB 2] out of the air and isolate it for disposal.

Given this progress, many scientists wonder why the world -- and especially the U.S. -- isn't moving faster to reduce the chances that global warming will bring nasty surprises. The reason for the inaction is "not the science and not the economics," says G. Michael Purdy, director of Lamont-Doherty. "Rather it is the lack of public knowledge, the lack of leadership, and the lack of political will."

The Bush Administration counters that taking steps is simply too costly. Imposing limits on the U.S. would throttle growth and put America at a competitive disadvantage around the world. "No nation will mortgage its growth and prosperity to cut greenhouse-gas emissions,"

says Energy Secretary Abraham. In any case, the White House is not ignoring the issue. It has called for voluntary reductions and it is funding research into new technologies. "If we are successful in developing carbon sequestration and cars that run on hydrogen fuel cells, that solves most of the problem with global warming," Abraham argues. "We may disagree on targets, but no one is going to reach any targets if we don't make these investments."

But most experts believe that mandatory curbs are essential and that they can be implemented at reasonable cost. Indeed, as states jump in with their own patchwork of rules, execs are beginning to say that it may be time to push for uniform national limits. That's what happened in 1990 with pollution rules. Faced with the prospect of dozens of state regulations, companies helped push for federal Clean Air Act amendments that reduced sulfur dioxide emissions through a market-based trading system. The law was a huge success. "We reduced emissions aheadof schedule and at lower cost," says Xcel Energy CEO Brunetti. "It's a great example of what can be done."

The same sort of trading scheme would bring similarly inexpensive greenhouse-gas reductions, many economists, politicians, and execs believe. The EU plan puts a cap on emissions for each country and allows emitters to buy and sell permits to release certain amounts of emissions. In the U.S., a market for trading carbon emissions -- the Chicago Climate Exchange -- already operates. And a bill to set up a cap-and-trade scheme, introduced by Senators John McCain and Joseph I.Lieberman (D-Conn.), is expected to win more votes than the 43 it garnered -- against the odds -- last year.

These steps are just the beginning, though. Even drastic measures -- such as implementing revolutionary energy technologies or grabbing carbon from the air -- won't stop this great global experiment from being conducted. "We won't cure this problem," cautions Henry Jacoby, co-director of Massachusetts Institute of Technology's Joint Program on the Science & Policy of Global Change. "The hope is that we can lower the risk of some of the more possible damaging outcomes." Companies and nations have begun to respond, but there is a long way to go, and onlytwo choices: Get serious about global warming -- or be prepared for the consequences.

MANY SCIENTISTS AGREE ON THE BASICS OF GLOBAL WARMING... TOTAL CO[SUB 2] EMISSIONS:

MILLIONS OF METRIC TONS

1751 - 0

1775 - 4

1800 - 8

1825 - 17

1850 - 54

1875 - 188

1900 - 534

1925 - 975

1950 - 1,630

1975 - 4,613

2000 - 6,611

Data: Oak Ridge National Laboratory, NASA Goddard Institute for Space Studies

AND THE EFFECTS ON THE PLANET COULD BE DIRE

FLOODING Seawaters could rise almost a meter in this century, and continue going up. Some coastal regions already see seasonal flooding, and the situation would get worse as water levels rise.
OCEAN DISRUPTIONS Coral reefs are under pressure from changes in water level and temperature. As more carbon goes into the sea, plankton could suffer, and that would affect species higher up the food chain.

SHIFTING STORM PATTERNS There are no data to show an increase in violent storms right now, but many scientists believe warming will bring more violent and unpredictable climate events.

REDUCED FARM OUTPUT In certain regions, each degree rise in the surface temperature brings a further drop in crop yields.

ANIMAL EXTINCTIONS Some species are already moving to cooler regions --and some aren't making it. Global warming may not yet be a factor,but it will almost certainly take its toll on species.

DROUGHTS In past periods of climate change, whole sections of Africa

turned to desert. In extreme scenarios, areas that are currently fertile could become barren and dry.

SOME COMPANIES ARE ALREADY MAKING CHANGES...

AMERICAN ELECTRIC POWER Is investing in renewable energy projects inChile, exploring ways to burn coal more cleanly, and testing methods to sequester carbon.

FLORIDA POWER & LIGHT Invested in 42 wind facilities and energy efficiency, eliminating the need to build 10 power plants.

GENERAL ELECTRIC Purchased Enron's wind business and a solar energy company; doing research on earth-friendly hydrogen and lower-emission jet engines and locomotives.

GENERAL MOTORS Developing hydrogen-powered cars that don't emit CO[SUB2].

INTEL Researching chemicals, for use on chip production lines, that don't contribute to greenhouse effect; developing ultra energy-efficient chips.

TOYOTA The world leader in hybrid gas-electric cars that deliver superior fuel efficiency. ...

BUT GOVERNMENTS MUST SHOW LEADERSHIP

THE U.S. is funding research in new energy technologies, while calling for voluntary reductions in carbon emissions. But both parties have failed to make global warming a top policy priority. Some states are now calling for mandatory cuts and some are requiring that electricity be generated from alternative sources.

THE EUROPEAN UNION will begin a carbon-cutting and trading system in January. The EU has also made a deal with auto makers to cut vehicle emissions. In addition, Britain has been particularly aggressive, setting a long-term target of 60% reduction in carbon emissions.

CHINA is struggling to devise a road map that will allow for continued, rapid growth without huge rises in pollution and greenhouse-gas emissions.

JAPAN hosted and signed the Kyoto accord on emissions reductions in 1997. It hopes to meet its commitments through conservation efforts and increased use of nuclear power.