A panel of top American scientists declared today that global warming was a real problem and was getting worse, a conclusion that may lead President Bush to change his stand on the issue as he heads next week to Europe, where the United States is seen as a major source of the air pollution held responsible for climate change.

In a much-anticipated report from the National Academy of Sciences, 11 leading atmospheric scientists, including previous skeptics about global warming, reaffirmed the mainstream scientific view that the earth's atmosphere was getting warmer and that human activity was largely responsible.

"Greenhouse gases are accumulating in earth's atmosphere as a result of human activities, causing surface air temperatures and subsurface ocean temperatures to rise," the report said. "Temperatures are, in fact, rising."

The report was requested by the White House last month in anticipation of an international meeting on global warming in Bonn in July but arrived just before President Bush leaves next week for Europe, a trip that includes talks on global warming with leaders of the 15 European Union countries in Goteborg, Sweden.

European leaders expressed outrage in March when Mr. Bush rejected the global warming pact known as the Kyoto Protocol, an international treaty negotiated in Kyoto, Japan, in 1997, and the subject has been building as an important test of the administration's foreign policy.

In the White House's first official acknowledgment of the academy's conclusions, Condoleezza Rice, Mr Bush's national security adviser, told reporters today, "This is a president who takes extremely seriously what we do know about climate change, which is essentially that there is warming taking place."

Mr. Bush and many in his cabinet, who discussed the subject at length on Tuesday, have been trying to hammer out a proposal on limiting the pollutants that cause global warming.
"A cabinet-level working group is still working on what it wishes to say to the president before we go to Europe," Ms. Rice said.

She said Mr. Bush would talk with the allies "a little bit about what we've learned thus far."

Without being specific, Ms. Rice said Mr. Bush was being guided by certain principles in formulating a proposal.

"One would want to be certain that developing countries were accounted for in some way, that technology and science really ought to be important parts of this answer, that we cannot do something that damages the American economy or other economies because growth is also important," she said.

In response to critics who have suggested that Mr. Bush is ignoring an issue of mounting international concern, Ms. Rice portrayed the group as feverishly committed to educating itself and coming up with a proposal.

"It has been a matter of bringing up to speed some of the highest-ranking people in this government," she said. "I would dare say -- dare challenge you to find a situation in which you've had so many high-ranking people sitting there week after week after week, understanding the challenge that we face in global climate change, everybody from the vice president, the secretary of state, the secretary of interior, secretary of agriculture. It has been quite something to see all of these people grappling with the issue."

Administration officials have said privately that the White House could have handled the matter with greater tact, and Ms. Rice conceded as much today.

"The president had made clear when he was a candidate that he did not believe the Kyoto Protocol addressed the problem of climate change in a way that the United States could support," she said. "In retrospect, perhaps the fact that we understood that we had already said this was not immediately observable to everybody, and it might have been better to let people know again, in advance, including our allies, that we were not going to support the protocol."

This was unusually blunt talk from a White House that until now has fastidiously avoided the phrase "global warming" and repeatedly expressed doubts about the clarity of the science underlying the theory that emissions from smokestacks and tailpipes were heating the atmosphere in ways that posed a threat.

In an indication of the headwind that Mr. Bush is sailing into next week in Europe, the journal Science, published by an American scientific organization, recently carried an open letter signed by 16 prestigious scientific panels in countries around the world calling for "prompt action" to reduce the gases like carbon dioxide that trap heat like in a greenhouse.

The increase in temperatures, the editorial said, "will be accompanied by rising sea levels, more intense precipitation events in some countries and increased risk of drought in others and adverse effects on agriculture, health and water balance."

It continued, "We urge everyone -- individuals, businesses and governments -- to take prompt action to reduce emissions of greenhouse gases."

Many international business executives have been pressuring the administration to move more aggressively on the issue. And so has a powerful band of Mr. Bush's closest advisers, including Secretar
of State Colin L. Powell, Ms. Rice, Treasury Secretary Paul H. O'Neill, and Christie Whitman, the administrator of the Environmental Protection Agency.

Today's report reflects the increasing certainty of the scientific community here and abroad that the warming of the last 50 years is probably because of the increase in greenhouse gas concentrations. The panel said the degree of confidence in this conclusion was "higher today than it was 10 or even 5 years ago."

Still, it said, large uncertainties limit predictions of the extent and consequences -- good and bad -- of future warming. But it affirmed the scientific consensus that human-caused climate warming could well be a dominant environmental problem throughout the new century, depending on how fast the gases accumulate in coming decades.

"Human-induced warming and associated sea level rises are expected to continue through the 21st century," it said.

And it said that "national policy decisions made now and in the longer-term future will influence the extent of any damage suffered by vulnerable human populations and ecosystems later in this century."

The report thus all but eliminates one reason the administration has been using to forestall any action on global warming.

And it deals a strong card to Democrats on Capitol Hill who have long sought more aggressive action on global warming. Senator John Kerry, Democrat of Massachusetts and a leading advocate of action said of the report, "It confirms in stark terms the reality that many of us had accepted a considerable amount of time ago and refutes an effort by the White House to seek some sort of escape hatch from that reality."

Senator Chuck Hagel, Republican of Nebraska and a longtime critic of the Kyoto Protocol, instead highlighted the uncertainty mentioned in the report and drew the opposite conclusion of Mr. Kerry.

"This report is certainly not a prescription for the drastic measures required under the Kyoto Protocol," Mr. Hagel said in a statement.

Nonetheless, in a nod toward the unanimity of the scientific community, he added: "This report does provide us with enough evidence to move forward in a responsible, reasonable and achievable way to reduce greenhouse gas emissions. It provides us with a basis to move forward with an alternative to the Kyoto Protocol."

Environmentalists hailed the report as a significant step in the long effort to force the United States to curtail greenhouse gases. Phil Clapp, president of the National Environmental Trust, said, "The president can no longer wiggle out of aggressive action by arguing that the science is inconclusive."

Mr. Clapp also suggested that the report called into question Mr. Bush's proposed energy plan, which seeks to step up production of coal, oil and gas-fired power plants.

"This makes the president's energy plan look completely irresponsible," he said.

Mr. Clapp said environmental groups had estimated that if the energy plan was fully put into effect, it would increase the pollution that causes global warming by 35 percent over the next decade.
The report was written by 11 atmospheric scientists who are members of the National Academy of Sciences. The authors included Dr. Richard S. Lindzen, a meteorologist at the Massachusetts Institute of Technology, who for years has expressed skepticism about some of the more dire predictions of other climate scientists about the significance of human-caused warming.

The report was requested on May 11 in a letter to Dr. Bruce Alberts, the president of the National Academy of Sciences, from John M. Bridgeland, deputy assistant to the president for domestic policy, and Gary Edson, deputy assistant to the president for international economic affairs.

A statement from the academy today said, "The White House requested this fast-track review of the state of climate science in preparation for international discussions on global warming scheduled to take place in the coming weeks."

Initially, the White House asked two questions of the academy: What are the greatest strengths and weaknesses in the science pointing to human-caused warming? And, are there significant differences between the full scientific analysis completed recently by the Intergovernmental Panel on Climate Change, sponsored by the United Nations, and the final executive summary?

There have been three assessments of global warming by the international panel since 1990, and each has drawn a more conclusive picture than the last of the link between human activities and the prospects for significant harm to agriculture, ecosystems and coastlines.

But conservatives in Congress -- notably Senators Hagel and Larry E. Craig, Republican of Idaho -- and groups representing industries whose business depends on fossil fuels have long criticized the findings of the international panel as biased, pointing particularly to differences between the voluminous chapters on complicated scientific points and briskly worded summaries that tend to influence policy.

The panel, led by Dr. Ralph J. Cicerone, the chancellor of the University of California at Irvine, met initially in California and spent the next weeks intensively sifting the existing science.

The report does provide some ammunition for critics in its description of the conclusion of the international climate group. It concluded, for example, that the international panel had a tendency in its executive summary to understate caveats and focus on the harsher possible consequences of climate warming. But overall, the panel described the international work as "admirable" and robustly supported its conclusions.

In a telephone interview today, Dr. Cicerone said he hoped the report, by spelling out the scientific basis for various predictions, would dispel some unwarranted skepticism about aspects of the warming problem.

One climate scientist who critiqued a draft of the new report for the academy said no one in the administration should be surprised at the firm nature of the result.

"They asked a string of questions that might have been appropriate in 1990," the scientist said.

"Hello?" he said. "Where've you been the last decade?"

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