Report: Human activity fuels global warming

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Today's release of a widely anticipated international report on global warming coincides with a growing clamor within the United States to reduce greenhouse gas emissions and prevent the potentially devastating consequences of global climate change.

"There's more interest in this now than at any time in the last 20 years," says Ronald Prinn, TEPCO Professor of Atmospheric Sciences at MIT, who was a lead author of the report issued by the Intergovernmental Panel on Climate Change (IPCC).

The report issued today in Paris, a 21-page summary of a much longer study on the science behind climate change, concludes there is a greater than 90 percent chance that greenhouse gases from human activity are responsible for most of the steadily rising average global temperatures observed in the past 50 years.

"There's clear evidence that greenhouse gases have been increasing by very large amounts since preindustrial times, and the vast majority of these increases are due to human activity," said Prinn, whose specific task on the panel was to assess this issue.

This is the fourth climate report issued by the IPCC since it was established by the U.N. in 1988. Prinn, who is the director of MIT's Center for Global Change Science, was one of more than 100 lead authors for the three-year study, which involved climate researchers from around the world.

For the first time, the IPCC provides extensive evidence of the regional signals of climate change, including rising continental-scale temperatures, rising sea levels, shrinking of Arctic summer sea ice and decrease in snow cover in the Northern Hemisphere. It also offers predictions for how rising temperatures will affect the planet in decades to come.

Taken as a whole, the report presents a strong case that the United States, which is responsible for about 25 percent of global greenhouse gas emissions, should take much more vigorous steps to curb its emissions along with the other major emitters around the world, Prinn said.

"Overall, the scientific evidence for human influence on climate has strengthened significantly in the past half dozen years, and the case for decreasing greenhouse gas emissions is significantly more compelling than it was six years ago," he said.

Greenhouse gases, which include methane, nitrous oxide, ozone, chlorofluorocarbons and their replacements (hydrofluorocarbons) as well as the better-known carbon dioxide, trap infrared radiation in the Earth's atmosphere, inhibiting the planet's cooling capability. Burning of fossil fuels is a major contributor to greenhouse gas emissions, but agricultural activities and deforestation also contribute.

"It's not just the highly industrialized nations that are involved here," Prinn said. "To some degree, every person on the planet is responsible, but some are much more responsible than others."

There is now a near-universal scientific consensus that human activity is driving climate change, but 10 years ago, Prinn himself was not convinced that that was the case. But, as the evidence mounted, Prinn concluded that the changes were too great to be explained by natural

climate variations.

Other highlights of the report include:

-- While global temperatures have risen significantly, the rise is less than expected from the greenhouse gases alone, because of the cooling effect of sulfate aerosols, another type of pollutant caused by fossil fuel combustion. Efforts already underway to reduce those aerosols, which cause acid rain and are harmful to human health, could lead to greater future warming.
-- For the first time, the IPCC has placed odds on the accuracy of its climate predictions: The report offers several different greenhouse gas emissions scenarios and, for each one, predicts the likelihood of a certain temperature increase--for example, a two-thirds chance that global temperatures will rise 2.4 to 6.4 degrees Celsius for one high-emissions scenario.

Those odds will help policy-makers decide how much effort is needed to lessen or adapt to the potential impacts of climate change, according to Prinn.

"I'm very pleased because this has been a quest by the climate researchers at the Center for Global Change Science and the Joint Program on the Science and Policy of Global Change at MIT for more than a decade," he said. "In order to help make policy decisions, scientists have got to provide the uncertainties on their key numbers."

In recent weeks, several climate change bills have been introduced in Congress, and Prinn anticipates that he and other MIT researchers will be asked to testify on the scientific, technological and economic aspects of the proposed legislation.

In late November, Prinn spoke to a group of 36 newly elected members

of Congress at Harvard's Kennedy School of Government. The representatives were very interested in the topic of global warming, he said.

"It was very clear that this is something they are hearing from the people that elected them," whose attention to climate issues has been drawn in part by destructive storms like Hurricane Katrina and decidedly un-winter-like temperatures in the Northeast, said Prinn.

"Many of the newly elected members were beginning to ask whether the United States is doing what it should be doing on this issue," he said.

In addition to reducing emissions, the world should also be thinking about the need to prepare for and adapt to the effects of climate change, Prinn said. For example, it may not be wise to build new infrastructure in coastal areas that may be inundated with rising waters, he said. The IPCC report emphasizes that we are already committed to future warming due simply to the greenhouse gases already in the atmosphere.

Later this year, the IPCC will issue two more reports. One focuses on possible mitigation strategies, while the other will address the impact of climate change on global ecosystems and economies.

Source: MIT