Treaty to limit CO2 should be followed by similar limits on other greenhouse pollutants

October 22 2009

When world leaders meet in Copenhagen in December to hash out a treaty limiting carbon dioxide emissions, they should begin planning a future summit to address other pollutants - from soot to ozone - that don't remain in the atmosphere as long as carbon dioxide, but nevertheless are major contributors to global warming.

That is the view of University of California, Berkeley, researcher Stacy C. Jackson, who presents her arguments in a policy piece appearing in the Oct. 23 issue of the journal *Science*.

Jackson, 37, a Ph.D. student in the Energy & Resources Group at UC Berkeley, researched the effects of short-lived pollutants like soot that stay in the atmosphere from days to weeks; medium-lived pollutants like methane that may remain airborne for a decade; and the long-lived greenhouse gases such as carbon dioxide and nitrous oxide, which will plague the planet for centuries. Over a 20-year window, the short- and medium-lived emissions make up over half the human contributions to global warming, Jackson said.

"We know we have a long-term problem and that we need to reduce CO_2 aggressively, but scientists are becoming concerned about whether there are going to be more climate changes in the near term than we previously believed," said Jackson. "Because we know these other pollutants play a big role, it would be to our benefit to set up the institutional framework now so that we can act quickly to mitigate the changes happening in the near term."

Pollutants like soot and ozone are well-known greenhouse pollutants, but scientists and policy makers have focused most of their attention on the gorillas in the room: carbon dioxide and, to a lesser extent, methane - pollutants that have had the biggest historical impact on global warming. CO_2's long-term effects, in particular, have alarmed scientists and the public, since the level of CO_2 in the atmosphere now - 386 parts per million - is already higher than it has been in the past 100,000 years, and continues to rise.

Numerous recent studies, however, have found the impacts of global warming accelerating, with faster melting of glaciers and sea ice and higher temperatures than predicted by climate models. Climatologist James Hansen of NASA published a paper last year in which he calculated that the atmospheric CO_2 levels today are similar to what they were when the planet was ice-free 100,000 years ago.

In addition, biologists are finding that plants and animals are already affected by global warming, at lower temperatures than initially projected.

"All the things we have been observing - changes in sea ice, temperature and impacts - plus what we are learning about abrupt climate changes in the past, suggest that the near term is of concern, in addition to the long term," Jackson said. "Short- and medium-lived pollutants account for half of our near-term impact. They are not a secondary source."

Jackson urges policymakers, first of all, to make aggressive reduction targets for carbon dioxide and other long-lived pollutants. Then, however, they must re-categorize methane as a medium-lived pollutant, not a long-lived one, and establish a new ad hoc working group to craft a treaty for short- and medium-lived pollutants.

"We need two separate treaties," she said. "A treaty on short- and

medium-lived pollutants should have a dynamic framework, because as we learn more, it will become obvious whether it's necessary to accelerate near-term mitigation efforts to influence near-term climate."

She acknowledged the complexity of the problem, noting that different components of soot, for example, have opposing impacts. The black carbon in soot has a warming effect, while the organic carbon has a cooling effect. Sulfate aerosols the cause of acid rain have a cooling effect that varies geographically based on the atmospheric availability of reactants and the presence of clouds or ice.

In addition, "while long-lived pollutants like CO_2 will mix well around the planet during their lifetime in the atmosphere, short-lived pollutants, like particulates and aerosols, aren't going to mix because they can't travel far enough in the weeks or months they're airborne," said John Harte, UC Berkeley professor of energy and resources. "So, geographic issues become much more important for short-lived versus long-lived pollutants."

Because of this complexity, work needs to start now on a framework to regulate them, Jackson said.

"Nobody knows whether we have crossed a threshold yet where we've reached a point of no return," Jackson said. "We are still learning whether there are thresholds and where they are, but the concern is that we are approaching what could be a threshold."

"Depending on what we do over the coming 20 years, we really can have an influence on what the future of our planet will look like," Harte said.

Source: University of California - Berkeley (news : web)