

## CLIMATE CHANGE

# New Push Focuses on Quick Ways To Curb Global Warming

NASA climate modeler Drew Shindell knew his research would raise eyebrows. But he was overwhelmed by the response to a paper published last week in *Nature Geosciences* that modeled the causes of Arctic warming over the past century. “‘Did you really say aerosols are responsible for half or more of the warming in the Arctic?’” he describes a typical e-mail.

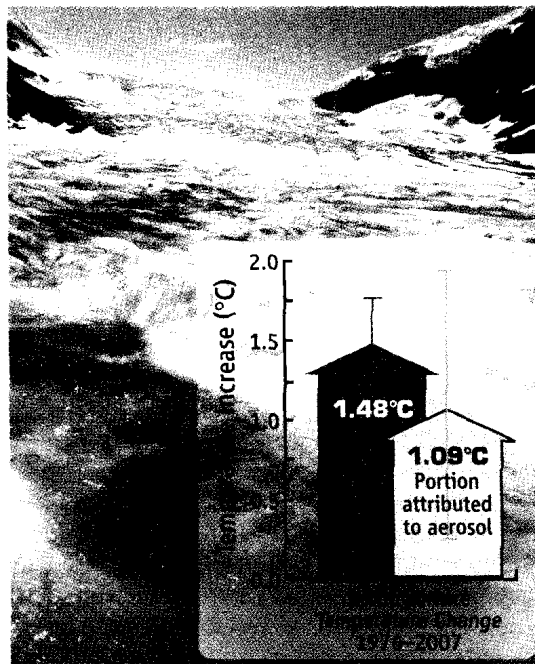
He did. Carbon dioxide may get all the attention, Shindell says, but black carbon—a component of soot—is also an important factor in global warming. He and other scientists say that reducing emissions of black carbon and other short-lived pollutants that contribute to global warming could buy the world crucial time while governments begin the slow overhaul of global energy systems that will be required to reduce emissions of  $\text{CO}_2$ , which comprise 77% of all greenhouse gas emissions. “Short-lived carbon forcers like methane, black carbon, and tropospheric ozone contribute significantly to the warming of the Arctic,” Secretary of State Hillary Clinton said in a speech last week. “Because they are short-lived, they also give us an opportunity to make rapid progress if we work to limit them.”

Dirtier air has slowed global warming over the past century by blocking solar radiation. But the four short-lived pollutants that scientists are targeting actually warm the atmosphere. Methane and hydrofluorocarbons (HFCs) are greenhouse gases like  $\text{CO}_2$ , trapping radiation after it is reflected from the ground. Black carbon and tropospheric ozone, an element of smog, are not greenhouse gases, but they warm the air by directly absorbing solar radiation. Compared with  $\text{CO}_2$ , which can persist in the atmosphere for up to 3000 years, black carbon remains for only 2 weeks and methane for no more than 15 years.

Environmental activists such as Durwood Zaelke of the nonprofit Institute for Governance and Sustainable Development want Clinton to ask the eight Arctic nations, whose foreign ministers will meet in Norway on 29 April, to create a partnership to support technology and joint demonstration projects that limit diesel emissions globally and particulates from cookstoves and chimneys in the developing world. The U.S. Environmental Protection Agency is also considering including particulate emissions in an upcoming

ruling on using the Clean Air Act to fight climate change, says the agency’s Paul Gunning. “It’s important,” says University of California, San Diego, atmospheric scientist V. Ramanathan. “The joint benefits for human health and climate would be considerable.”

For methane, Rafe Pomerance of the non-profit Clean Air-Cool Planet would like the Obama Administration to broaden its well-respected Methane to Markets Partnership, which features demonstration programs to



**Black mark.** A new analysis pins a significant portion of recent Arctic warming on soot (foreground).

limit emissions from farms, landfills, and energy installations.

Representative Henry Waxman (D-CA), chair of the House Energy and Commerce Committee, has asked the Administration to propose adding HFC language to the Montréal Protocol, which controls ozone-destroying chemicals. (HFCs don’t destroy ozone, but they are 1400 times more potent than  $\text{CO}_2$  as a warming agent, making up 2% of world greenhouse gas emissions and rising fast.) The Administration says it is considering doing so, although it must act by next month to be considered by the next official meeting of treaty participants in November. Last month, Waxman proposed the first-ever federal regulation of HFCs as part of a massive climate bill he introduced in draft form.

—ELI KINTISCH