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Cutting Local Air Pollutants Reduces Warming, Saves Millions of Lives and Improves Crop Yields

*Black Carbon Soot and Ground-Level Ozone Are Key Targets
For Fast-Action Mitigation, According to the UN*

Nairobi, Kenya, February 21, 2011—Using existing technologies and institutions to cut two local air pollutants can save millions of lives and avoid tens of billions of dollars of crop losses annually, while halving regional warming for 30 to 60 years. This will reduce the risk that the Arctic, Himalayas and other critical ecosystems will tip into irrevocable and potentially catastrophic changes, such as the accelerated melting of permafrost, which releases methane and carbon dioxide—the top two climate forcers.

These are among the findings of a new scientific assessment from the United Nations Environment Programme (UNEP) and World Meteorological Organization (WMO), in collaboration with a global team of scientists released this week by UNEP at its Governing Council meeting in Nairobi.

The two local air pollutants are sooty dust known as black carbon and ground-level ozone in the troposphere. (This is different from the good ozone in the upper atmosphere, or stratosphere, that shields us from harmful ultraviolet rays.)

These local air pollutants can be cut with technologies that are already in use around the world at scale, and through existing laws and institutions at the national and regional level that already have the expertise needed to control air pollution.

“Our existing air pollution tools can quickly be adapted to become the best short-term climate fighters the world has to slow warming while we continue to build the political will to manage CO₂ emissions,” said Durwood Zaelke, President of the Institute for Governance & Sustainable Development (IGSD). He added, “CO₂ remains the single largest contributor to climate change, and the pollutant that we have to control to reduce long-term warming.”

The benefits for health, crops, and regional warming are enjoyed most by those who cut their own air pollution. “The countries that invest most in these solutions will reap the greatest benefit,” noted Zaelke, especially the countries of Asia, which the Assessment calculates will be the biggest winners.

The benefits can come quickly, in years to a couple of decades. This is in contrast to cuts in CO₂, which do little to help climate in the next few decades, but are nonetheless essential to avoid long-term warming after 2070 and beyond.

Black carbon comes from the incomplete combustion of fossil fuels, mostly through the use of diesel engines and burning of biomass, including in cook stoves and brick kilns. Ground-level ozone comes from the interaction of sunlight with methane and other volatile compounds. Controls on methane are the best way to reduce the bad ozone.

The world can cut the rate of warming in half and stay below the critical 1.5°C guardrail for 30 or more years by cutting black carbon and ground-level ozone, according to the UNEP/WMO Assessment. During the 2009 UN climate change talks in Copenhagen, more than 100 countries called for fast action to keep from passing the 1.5°C mark, which an increasing number of climate scientists say is the outer limit for climate impacts the world can adapt to.

The UNEP/WMO Assessment also calculates that cuts in black carbon and bad ozone can, along with expected CO₂ cuts, delay passing the 2C level for 60 years. The 2°C limit was set earlier by the biggest climate emitters, including the US, Europe, Japan, and China.

“This assessment makes clear that we need to address CO₂ emissions to control long-term warming. It also makes clear that cutting CO₂ now will *not* reduce warming in the next 20-30 years. This means passing the 2°C level several decades earlier if we don’t reduce these local air pollutants,” said Zaelke.

In 2009, Zaelke, along with Nobel Laureate Mario Molina, black carbon expert Dr. Veerabhadran Ramanathan, and others, published a paper in the [*Proceedings of the National Academy of Sciences*](#) outlining strategies to achieve near-term climate benefits by reducing short-term climate warming agents, including black carbon and tropospheric ozone. The Molina paper also included measures to phase down another powerful climate forcer, hydrofluorocarbons, or HFCs, using the Montreal Protocol treaty. “Cutting HFCs could add up to another decade to the delay in passing critical temperature limits,” said Zaelke.

Cutting these so-called short-lived climate forcers, including black carbon, bad ozone, and methane, as well as HFCs, “is critical for the world’s vulnerable peoples and vulnerable ecosystems,” said Zaelke. “We can buy an insurance policy for the next 30 to 60 years, and even more with HFCs,” added Zaelke. “Fast action to cut short-term climate forcers, reduce risk, and improve the lives of those currently living on our Planet for more than half a century is a worthwhile goal,” said Zaelke. “It also is a moral imperative.”

“We also have to start now with aggressive cuts in CO₂ if we want to win the longer term climate battle,” Zaelke added. “It’s no longer one or the other; we need to cut both CO₂ and the other climate forcing agents.”

The measures analyzed in the UNEP/WMO Assessment would go a long way toward protecting one of the world’s most vulnerable regions – the Arctic. The Assessment builds on a 2010 paper published by Mark Jacobson that calculates that controlling black carbon may be the only way to

save the Arctic – a key defensive shield that reflects heat back to space – from runaway loss of ice. A 2009 paper by Drew Shindell, who chaired the Assessment, and Greg Faluvegi, calculates that black carbon is responsible for 50 percent of the total 1.9°C increased Arctic warming from 1890 to 2007. Black carbon is a key warming agent for other glaciated regions as well, including the Himalayan-Tibetan Plateau in Asia, which is the main source of fresh water for hundreds of millions of people.

“2010 saw a number of devastating climate-related events, including the Russian heat wave and the floods in Pakistan that imposed tremendous costs in terms of human lives, livelihoods, and valuable resources,” said Zaelke. “We have an immediate opportunity now to limit similar events over the next few decades and avoid catastrophic damage.”

UNEP has been working to reduce regional air pollution across the globe for more than a decade, and is responsible for the creation of regional networks that cover the most critical areas of the world. UNEP’s efforts have supported action at the national level by strengthening existing domestic institutions for air pollution control.

“This assessment describes a critical opportunity for the world that is completely within our reach – the technology is available, it’s already being used in the real world, and it can be implemented through a variety of regional and local platforms already in place,” said Zaelke. “Even without considering the profound climate benefits, the benefits for health and agriculture alone justify fast and aggressive action.”

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UNEP and WMO, *Integrated Assessment of Black Carbon and Tropospheric Ozone: Summary for Decision Makers* (2011). <http://www.unep.org/gc/gc26/download.asp?ID=2197>.