Policies to curb short-lived climate pollutants could yield major health benefits

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Human sources of black carbon and other short-lived climate pollutants include flares from oil and gas wells, such as these in the Bakken Field of North Dakota. Credit: Jeff Peischl/NOAA CIRES

A commitment to reducing global emissions of short-lived climate pollutants (SLCPs) such as methane and black carbon could slow global warming while boosting public health and agricultural yields, aligning the Paris Climate Agreement with global sustainable development goals, a new analysis by an international research panel shows.

Methane and black carbon - or soot - are the second and third most powerful climate-warming agents after carbon dioxide. They also contribute to air pollution that harms the health of billions of people worldwide and reduces agricultural yields.

"Unlike long-lived greenhouse gases such as carbon dioxide, SLCPs respond very quickly to mitigation. It's highly likely that we could cut methane emissions by 25 percent and black carbon by 75 percent and eliminate high-warming hydrofluorocarbons altogether in the next 25 years using existing technologies, if we made a real commitment to doing this," said Drew T. Shindell, professor of climate science at Duke University's Nicholas School of the Environment.

Acting now to reduce these emissions would contribute to long-term goals set under the 2015 Paris Climate Agreement while concurrently offering governments substantial benefits in the short term for investing in sustainable development - a set of goals through 2030 that countries also agreed to in 2015.

"The urgency in dealing with SLCPs now rather than later is that if we wait to address them, we continue to incur all these damages - increased public health burdens and reduced agricultural yields - along the way," Shindell said. "If we want to avoid those costs, and keep millions of people from dying, we need to do this now.

"Adding a pathway goal would help reduce the risks faced by the current generation and our children, complementing the Paris Agreement's long-term target that reduces risks for future generations," he said.

Shindell and colleagues from 10 other international research institutions published their peer-reviewed policy forum article May 5 in *Science*.

The article builds upon previous work by the Climate and Clean Air

Coalition (CCAC), an international consortium of more than 100 countries and non-state partners working to reduce SLCPs. Shindell chairs the CCAC's Science Advisory Panel; his co-authors of the new policy forum are all members or affiliates of that panel.

In the new article, they point out that in addition to saving human lives and boosting global food security, curbing SLCPs will significantly slow the pace of climate change over the next 25 years. This could help reduce biodiversity losses and slow amplifying climate feedbacks such as snow-and-ice albedo that are highly sensitive to black carbon.

Under the Paris Agreement, many countries have already committed to reducing SLCPs, Shindell noted, yet they are combining those pledges into a single, so-called "CO2-equivalent" reporting method that lumps SLCPs into the same basket as carbon dioxide and other long-lived greenhouse gases. Maintaining separate reporting methods for each pollutant would provide a clearer understanding of the benefits associated with SLCPs' reduction.

"Targeting immediate reductions in SLCP emissions is the most beneficial path we can take toward achieving the Paris Climate Agreement's goal of reducing warming by 2oC," Shindell said. "You could, conceivably, delay reducing these pollutants for decades and still achieve that goal. But why would you want to if there are all these advantages to be gained by following this path, instead?"

More information: "A climate policy pathway for near- and long-term benefits," *Science* (2017). science.sciencemag.org/cgi/doi … 1126/science.aak9521

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