US energy experts say drilling can be made cleaner (Update)

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In this Aug. 19, 2008 file photo, a combine cuts durum near an oil well on Aug. 19, 2008, in Tioga, N.D. The worries about what drilling does to the air are both global and local, with scientists concerned about the effects on climate change as well as the possible health consequences from breathing smog, soot and other pollutants. (AP Photo/James MacPherson, file)

In the Colorado mountains, a spike in air pollution has been linked to a boom in oil and gas drilling. On the plains of north Texas, there's a drilling boom, too, but some air pollution levels have declined. Opponents of drilling point to Colorado and say it's dangerous.

Companies point to Texas and say drilling is safe.

The good news, nearly all sides agree, is that the technology exists to control methane gas leaks and other air pollution associated with drilling. The bad news is that the industry is booming so rapidly in the U.S. that some companies and some regulators can't seem to get ahead of the problems, which could ultimately cost billions of dollars to remedy.

The worries about what drilling does to the air are both global and local, with scientists concerned about the effects on climate change as well as the possible health consequences from breathing smog, soot and other pollutants.

Industry practices, enforcement, geography and even snow cover can minimize or magnify air pollution problems.

"It's like a vehicle. Some cars drip oil," said Russell Schnell, deputy director of the U.S. Earth System Research Laboratory. "You have wells that are absolutely tight. And you have other places where a valve gives out, and you have huge leaks."

Hydraulic fracturing, or fracking, has made it possible to tap into deep reserves of oil and gas but has also raised concerns about pollution. The industry and many federal and state officials say the practice is safe when done properly, but environmental groups and some scientists say there hasn't been enough research.

Some environmentalists say if leaks and pollution can be minimized, the boom has benefits, since gas burns much cleaner than coal, emitting half the carbon dioxide.

Former Vice President Al Gore told The Associated Press that it's "not irresponsible" to look at gas as a short-term substitute for coal-fired

electricity. But Gore added that the main component of gas, methane, is a more potent heat-trapping greenhouse gas than carbon dioxide. That means that if large quantities leak, the advantage over coal disappears, he said.

In Colorado, the National Oceanic and Atmospheric Administration estimated that 4 percent of methane was leaking from wells, far more than previously estimated, and that people who live near production areas may be exposed to worrisome levels of benzene and other toxic compounds present in oil and gas.

So far, NOAA scientists say they haven't found signs that gas or oil drilling is contributing to a global rise in methane.

"Not the mid-latitudes where the drilling is being done, which is interesting," said James Butler, head of global monitoring for NOAA.

Across the industry, the technology for stopping leaks can be as simple as fixing seals and gaskets, or it can involve hundreds of millions of dollars of new construction.

"I think it's totally fixable," Schnell said. "At least the bigger companies, they are really on top of this."

Gore added that when companies capture leaking methane, they end up with more to sell. "So there's an economic incentive to capture it and stop the leaking," he said.

Another major source of worry is the industry's practice of burning off, or flaring, natural gas that comes out of the ground as a byproduct of oil drilling. Over the past five years, the U.S. has increased the amount of flared and wasted gas more than any other nation, though Russia still burns off far more than any other country.

In some places, energy companies haven't invested in the infrastructure needed to capture and process the gas because the oil is more valuable.

In the Bakken Shale oil fields of North Dakota, for example, about 30 percent of the natural gas is flared off because there aren't enough pipelines yet to carry it away. The amount of gas wasted in the state is estimated at up to $100 million a year. Officials in North Dakota said last month that the situation there might not be completely solved until the end of the decade.

NOAA scientists also say natural gas production has contributed to unusual wintertime smog in the West, particularly in regions surrounded by mountains and especially in snowy areas.

Ozone, the main component in smog, typically forms when sunlight "cooks" a low-lying stew of chemicals such as benzene and engine exhaust. Normally, the process doesn't happen in cold weather.

But NOAA researchers found that when there's heavy snowfall, the sun passes through the stew, then bounces off the snow and heats it again on the way back up. In some cases, smog in remote areas has spiked to levels higher than those in New York or Los Angeles.

In open regions that are more exposed to wind, the ozone vanishes, sometimes within hours or a day. But in Utah basins it can linger for weeks, Schnell said.

Evidence that gas drilling air pollution can be managed—but that more work may still need to be done—comes from north Texas, where the shale gas boom began about 10 years ago.

Mike Honeycutt, director of toxicology for the Texas Commission on Environmental Quality, said that in the early years of the boom, people

complained about excessive pollution. Regulators started using special hand-held cameras to pinpoint pollution sources and found some sites with high levels of benzene and other volatile organic compounds.

"It was a maintenance issue. They were in such a hurry, and they were drilling so fast, they were not being as vigilant as they should have been," Honeycutt said. "So we passed new rules that made them take more notice."

Honeycutt said the cameras, which cost about $100,000 each, have revolutionized the way inspectors monitor sites. Texas has also installed nine 24-hour air monitoring stations in the drilling region around Fort Worth, and more are on the way. Now, he said, even as drilling has increased, summer ozone levels have declined.

In 1997 there were only a few hundred shale gas wells in the Fort Worth area and the summertime ozone level hit 104 parts per billion, far above the national standard then of 85. By 2012 the number of wells had risen to about 16,000, but preliminary results show the ozone level was 87 last summer.

There's still room for improvement, Honeycutt said, but the trend is clear, since the monitoring is no longer showing worrisome levels of benzene.

The Environmental Protection Agency isn't completely convinced. This year, the federal agency cited Wise County in north Texas, a heavy gas drilling area, for violating ozone standards. Industry groups and the state have argued that the finding was based on faulty science.

The EPA has passed new rules on oil and gas emissions that are scheduled to go into effect in 2015, and in 2012 it reached legal settlements that will require companies to spend more than $14 million

on pollution controls in Utah and Wyoming. Colorado, Texas and other states have passed more stringent rules, too.

Carlton Carroll, a spokesman for the American Petroleum Institute, a lobbying group for the oil and gas industry, pointed out that many companies started developing the equipment to limit methane and other pollution before the EPA rule.

"API is not opposed to controls on oil and gas operations so long as the controls are cost-effective, allow sufficient lead time and can be implemented safely," Carroll said in an email, adding that the industry has requested some technical clarifications to the rule and is working with the EPA on those.

Prasad Kasibhatla, a professor of environmental chemistry at Duke University, said that controlling gas drilling pollution is "technically solvable" but requires close attention by regulators.

"One has to demonstrate that it is solved, and monitored," he said.