

# The Washington Post

“The most important mystery about U.S. climate change policy”

April 13, 2016

On the surface, it looks like extraordinarily good news. The United States is [burning less coal](#) — less of the fuel that contributes the most carbon dioxide to the atmosphere [when burned](#). Instead, we’re [swapping in cleaner burning natural gas](#), which could serve as a “bridge” to an era in which wind and solar provide the bulk of the nation’s power. And carbon dioxide emissions are already lower as a result.

Yet there’s a nagging problem here that just won’t go away. Environmentalists have charged for some time that the fracking boom — the rise in unconventional natural gas that is the key driver of all of this — has a dark underbelly. Natural gas’s principal component is methane, which is also a greenhouse gas. And if it gets to the atmosphere unburned, it has a much larger warming effect than carbon dioxide does, over a period of about 10 years.

So if there are enough leaks from the new wave of unconventional oil and gas drilling operations, it is possible to substantially undermine the climate benefits that accrue from less burning of coal — and moreover, to do so over the crucial next few decades, when all the key changes have to be made if there’s any hope of averting the worst climate damage.

Recent events and recent science alike are now forcing this issue. The Aliso Canyon natural gas leak near Los Angeles was simply enormous, pouring nearly 100,000 metric tons of methane into the atmosphere. It was the “largest methane leak in U.S. history,” according to a [recent report](#) by the scientific advisory panel of the Climate & Clean Air Coalition, a group of countries and partners trying to reduce emissions of short-lived climate change pollutants, such as methane. Similarly, a recently [released](#) infrared camera survey, conducted by helicopter, of some 8,000 U.S. oil and gas well pads in a number of high producing regions found leaks at 327 pads, or 4 percent overall. It concluded that the EPA “may be underestimating” emissions caused by oil and gas tanks on these sites in particular.

Meanwhile, still more [recent satellite research](#) is suggesting that U.S. methane emissions are on a big upswing — even as the EPA is expected to [soon report](#) new totals for methane emissions from oil and gas, as part of its broader annual inventory of U.S. greenhouse gas emissions submitted to the United Nations. And if it sticks with [preliminary figures](#), it will revise 2013 emissions upward by more than 25 percent, according to an [analysis](#) by the Environmental Defense Fund. (What happens with other years remains to be seen).

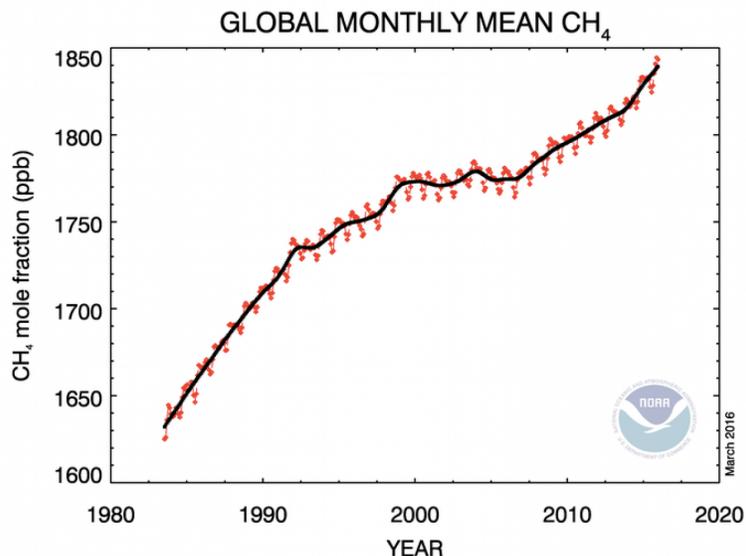
In the meantime, the numbers have already been disputed. “The release of these partially revised numbers is misleading,” [said](#) the American Petroleum Institute’s vice president for regulatory and economic policy, Kyle Isakower, in March. “We have every reason to believe that the final data, when

issued, will still indicate a significant downward trend in emissions even as oil and natural gas production has risen.” So the question is both urgent, and also difficult: Is the U.S. undermining its climate progress with invisible leaks of a second, even more potent greenhouse gas?

### “A little bit of a mystery right now”

Let’s start with the basics: Globally, concentrations of methane in the atmosphere, just like concentrations of carbon dioxide, are rising. The rise hasn’t been as steady, though — it actually appeared to stall in the 2000s. However, it is now on a major upswing again, which is certainly very bad news for the climate, and bad news that couldn’t come at a worse time.

But the question is, why?



That’s where things get complicated. Methane could definitely rise in the atmosphere because of more leaks from oil and natural gas operations. But it could also rise because there are more cows belching it into the air, or the world has changed how it feeds cows, or manages their manure — or, how it manages rice agriculture. Methane has many sources.

Scientific literature is somewhat contradictory about all this.

For instance, a blockbuster and much cited [study](#) in *Geophysical Research Letters* earlier this year used satellite observations to pick up an apparently huge boom (30 percent) in U.S. methane emissions from 2002 to 2014, one large enough to explain 30 to 60 percent of the recent trend. Seeking to trace the source of the emissions, the research targeted a broad region “in the central part of the country.” While the study pointedly noted that the time period in question is one that includes the fracking and natural gas boom, it also added that “the spatial pattern of the methane increase ... does not clearly point to these sources.”

“It would be very tempting to say it’s the rise in oil and gas production, the fracking, and so on,” says Daniel Jacob, a Harvard researcher who is one of the study’s authors. “But the pattern is not necessarily that. It could also be an underestimate of livestock emissions, those tend to be regionally overlapping.”

“It’s a little bit of a mystery right now,” Jacob continues. However, he adds, “why would livestock emissions have increased a lot? I don’t really know why that would be.”

Yet also earlier this year, a [much noted study in Science](#) came to a different conclusion — neither pointing the finger at oil and gas, nor at the United States. The research used an examination of the ratios between different isotopes of carbon in methane, and at least tentatively [attributed increasing global emissions to agriculture](#). The findings “rule out fossil fuel production as the major cause in the rise of methane levels in the atmosphere since 2007,” according to New Zealand’s National Institute of Water and Atmospheric Research, whose atmospheric scientist Hinrich Schaefer led the research.

### **Weighing the evidence**

Faced with contradictory studies like this, it helps to turn to expert assessments of the weight of the evidence. One example comes in the form of a [recent annual report](#) by the [scientific advisory panel](#) of the Climate & Clean Air Coalition. That board is comprised of a star-studded, international group of 14 scientists and experts, led by Drew Shindell of Duke University.

And this group is unprepared to let U.S. oil and gas off the hook. Its report asserts that atmospheric methane levels are rising “rapidly” and that the cause “is likely due to a number of factors, including increased emissions from agriculture activities, large increases in natural gas extraction and associate leaks.”

Duke’s Drew Shindell, chair of the panel, further alluded to oil and gas in an interview. “I think what all these results are suggesting is that, to first order, their efforts to reduce emissions from the oil and gas industry are a good thing, and they should keep going with that,” he said. “But the next level is that they need to make more progress and prevent overall methane emissions from going up as we exploit natural gas resources more, which is what appears to have been happening in the US.”

“The US story is, CO2 is decreasing, and we’re making more progress than most countries in the world,” Shindell continued. “But methane is going up, and it appears to be going up enough to offset the bulk of the benefit from reducing the CO2.”

However, the issue remains hotly debated and the industry, at least for now, has a different point of view. The American Petroleum Institute’s Isakower last month not only questioned the new, preliminary EPA figures, but argued that “even as oil and natural gas production has risen dramatically, methane emissions have fallen, thanks to industry leadership and investment in new technologies.”

### **The EPA’s upward revisions?**

If U.S. oil and gas operations – including unconventional gas operations tied to the fracking boom — are emitting more, then that should be recorded by the U.S. government. In particular, the EPA keeps an annual inventory (with a time lag) of all of the nation’s greenhouse gas emissions.

In previous inventories, the EPA has found “no significant trend in U.S. anthropogenic methane emissions from 2002 to present,” notes Jacob’s recent study – which challenges that conclusion.

It's not the only one. "Comparison of recent estimates of methane emissions with existing inventories such as that of the USEPA shows that current inventories underestimate methane emissions due to inaccurate measurements in some emissions sectors," such as oil and gas, concludes the recent document from the science advisory panel to the Climate & Clean Air Coalition.

"I do think that the evidence is strong that EPA has underestimated methane emissions," adds Rob Jackson, a researcher at Stanford who contributed to the recent helicopter based infrared camera study that found leaks at 4 percent of over 8,000 well pads in key U.S. drilling regions.

In a sign that the agency is taking note, a [draft version](#) of the annual report's latest installment bumped up 2013 emissions by 27 percent, from 7.3 million to 9.3 million metric tons, according to an [analysis](#) by the Environmental Defense Fund. A final EPA inventory up through 2014 is expected soon, and the numbers will be watched very closely.

"Their revision is going to bring their emissions up, I don't know how much. I don't think it's going to bridge the gap, but it's going to go in the right direction," says Harvard's Daniel Jacob.

### **If it's oil and gas, it ought to be fixable**

The good news, suggests Jackson, is that while it's very hard to do anything about a global trend in agricultural emissions, it's not so hard to clamp down on U.S. oil and gas leaks, which his latest study suggests are worse in some key areas — which means they can be targeted.

"We're democratizing leak detection," says Jackson. "New technologies, cheaper sensors, we're entering an era where citizens will have cameras they can use to film wellpads. We're close to having satellites that we'll be able to image single wellpads or clusters of wellpads. We'll crack this nut." If so, that would mean that the long term emissions problem remains carbon dioxide, and that while U.S. methane may have seen a temporary increase, it's controllable, despite any near term setbacks.

Mark Brownstein, who heads the oil and gas program at the Environmental Defense Fund, argues that ultimately, the question of whether emissions are now going up due to fracking in the U.S. is somewhat of a "red herring" — the fact is, there are substantial emissions from the oil and gas sector, and they're fixable, he argues. You simply have to regulate the industry, rather than let it police itself voluntarily — something President Obama pledged to do along with Canadian prime minister Justin Trudeau in March.

And if you fix methane, then unlike what happens with carbon dioxide, the stuff doesn't remain too long in the atmosphere, so the problem substantially cleans itself up over time (assuming, that is, that there isn't a spike from some other source, such as agriculture).

Until that happens, though, more studies will likely continue to probe the methane problem — and more activists will continue challenging fracking operations, and questioning whether we've undermined our gains from cutting back on coal.

“The methane issue is front and center on the debate around the legitimacy of natural gas, as an energy source, at least in the near term,” says Brownstein.