The Gas Industry's Dark Cloud:
Methane on My Mind

By Mina Hamilton

For decades the message has been clear: Natural gas is well - natural. Clean. Green. And worlds apart from dirty, climate-destroying coal. That was before Aliso Canyon.

What made the 'natural gas good -- coal bad' argument so plausible? The industry took advantage of one key fact: methane is invisible to the naked eye. Images of contented cows munching next to well rigs, and lush green meadows encircling compressor stations were totally convincing. *Indeed, there wasn't a wisp of smoke in sight.*

No emissions? No problem. Since nobody could see the problem, there was no need to address the vital fact that most of what is called 'natural' gas is in fact methane. And since in its first twenty years in the atmosphere, methane is far more destructive there than coal, it was better - at least for the fossil fuel industry - to focus on those contented cows.

That all changed on October 23, 2015, when a well in a gas-storage cavern deep underneath California's San Bernadino mountains ruptured. Thanks to an infrared-camera video[1] the otherwise invisible leak was revealed as a black cloud spewing into the sky.

For three and a half months, the plume carried its toxic load of methane into the sky, along with constant doses of benzene (also spelled 'benzine'), toluene and other carcinogens into the lungs and blood streams of local residents. Families, their children, cats and dogs sickened. Nose bleeds, dizziness and nausea were rife. Three local schools closed and more than 1600 people were evacuated.

Then on February 18, local residents and climate activists breathed a sigh of relief when the Aliso leak was capped. Still, one horrible figure stood out: some 100,000 metric tons of methane had escaped into the atmosphere.

Cement has been injected into the well as a supposedly permanent plug, but if Aliso is somewhat under control now, the gas and oil industry is not.

A study by the Environmental Defense Fund (EDF), the University of Colorado and the National Oceanic and Atmospheric Administration,[2] estimates methane

[1] https://www.youtube.com/watch?v=exfJ8VPQDTY
[2] David Zavala-Araiza et al, "Reconciling Divergent Emissions of Oil and Gas Methane Emissions," 12/22/2015, Proceedings of the National Academy of Science, http://www.pnas.org/content/112/51/15597.full - F2

releases from the industry in just one area -- the Barnett Shale formation in northern Texas. The total? 544,000 tons.[3]

As the *Texas Observer* notes, more methane being pumped into the atmosphere there every day than the daily amount released at Aliso Canyon.[4] And there are more than a dozen such shale-rich formations already in production or being developed in the US.

Just where are the leaks in the Barnett Shale? The EDF study points to three main sources. The twenty-five thousand wells in the area account for 53% of the problem. Yes -- that's 25,000 wells in just this one area.[5] Compressor stations account for 31% of the unwanted methane emissions and processing plants (such as de-hydration plants) release another 13%.

Ever since a ground-breaking study on methane by Drs. Anthony Ingraffea and Robert Howarth of Cornell University was published, methane releases at well-drilling sites have been flagged as a serious issue.[6]

Then there's the transfer of gas from well-sites to industrial facilities where the gas from different wells and pipelines is gathered, purified and then pushed along larger pipelines to customers hundreds of miles away. All these activities require compressors.

Infrared images by the environmental advocacy group, Earthworks, tell the story.[7] Multiple valves and seals, plus many other parts of the complex and intricate machinery of compressors are the culprits.

Sometimes a valve gets stuck open and stays open -- for days. Or an old seal degrades and starts leaking constantly. Or a storage tank hatch needing repair or a vent designed to release pressure, i.e., regularly burp methane clouds. There is also the problem of compressor blow-downs. The industry routinely claims such blow-downs last only minutes. But they can go on for hours.[8] And then there are the compressors at gas storage sites like Aliso Canyon, where leakage occurs every time gas is injected or withdrawn.

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[3] EDF has used a new method of combining on the ground estimates ("bottom-up") and over-flight data ("top-down") to analyze the Barnett Shale emissions. EDF has been accused by some critics of being biased towards the gas industry. Others cite a shift over the last several years with EDF moving towards a more critical assessment, particularly regarding methane emissions. http://insideclimatenews.org/news/07042015/edf-sparks-mistrust-and-admiration-its-methane-leaks-research-natural-gas-fracking-climate-change

[4] http://ecowatch.com/2016/02/23/methane-leaks-texas/

[5] http://www.pnas.org/content/112/51/15597.abstract. There are an estimated 3.2 million oil and gas wells in production or abandonned in the US.

[6] Drs. Anthony Ingraffea and Robert Howard published several ground-breaking papers on methane losses at fracked-gas well sites http://link.springer.com/article/10.1007%2Fs10584-011-0061-5

[7] https://www.youtube.com/watch?v=yzwqaO3e3L8&list=PL9BS7nDf-8trguolVzCgqR3FmzO67-hC0&index=1

[8] One blow-down at the Minisink Compressor in Orange County NY had a 6-hour blow-down.

So how many oil and gas industry compressors are there in the US? One estimate says more than 51,000, but this number from 2012 is certainly a low estimate now.[9] Some compressors are small, some large.[10] They all add up to *millions of tons* of methane being pumped into the atmosphere each and every year. It also adds up to a regulatory disaster: how can thousands and thousands of sites be adequately monitored and subject to strict controls regarding methane leakage? Simply put, they can't.

Nobody wants an Aliso Canyon disaster in their backyard. No one wants a noisy, pollution-generating compressor station in their backyard either. And then there's the fragile - and irreplaceable - backyard of our planet's atmosphere.

The methane problem makes it utterly clear. The health of the planet requires a complete rethinking of the current commitment in the US -- and the world -- to so-called 'natural' gas. Must we let for-profit corporations continue to poison our planet -- and ourselves? Instead let's call for an informed public discussion that could lead to a job-creating, accelerated roll-out of clean energy retrofits and a rich spectrum of conservation and renewable energy options.

We can call on all politicians to move us forward... but such a movement also starts with us, as individuals, families and communities.

Mina Hamilton writes frequently for Women and Life on Earth. She has been published in Mother Jones, the Progressive and the Nation. Formerly she was a Research Associate at Radioactive Waste Management Associates and served on the Board of Directors of Greenpeace USA.

[9] https://www3.epa.gov/airquality/oilandgas/2014papers/20140415compressors.pdf Table 3-9, pg 20.
[10] This figure includes the individual compressors at compressor stations. The industry average used to be about 4 compressors *per* compressor station. As pipeline companies have rushed to build larger pipelines the number of compressors have zoomed upwards to as many as 11 units *per station*.