Fracking, an end to life as we know it:

Facing industrial occupation and planetary collapse

Heather Cantino

Athens County Fracking Action Network

ACFAN.org

http://www.acfan.org/injection-wells/

Helmig, D. et al., Highly Elevated Atmospheric Levels of Volatile Organic Compounds in the Uintah Basin, Utah, *Environmental Science and Technology*, 3-13-14:

Dangerously high concentrations of air pollutants are threatening rural Utah: Winter levels of volatile organic compounds (VOCs) released from oil and gas wells in Utah's Uintah Basin were "**equivalent to the annual VOC emissions of a fleet of ~100 million automobiles**."

The pollutants include the carcinogens benzene and toluene and compounds that are precursors of ozone, which can cause respiratory problems.

Rachael Rawlins, Planning for fracking on the Barnett Shale: Urban air pollution, improving health based regulation, and the role of local governments,
Virginia Environmental Law Journal, v. 31, 2013:

Reexamination of possible childhood leukemia cluster in suburban Flower Mound, TX, where high levels of benzene from o&g operations had been documented, found that rates of childhood leukemia and childhood lymphoma in Flower Mound are significantly higher than expected.

— U Texas press release, March 27, 2014

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Lisa McKenzie et al. Birth outcomes and maternal residential proximity to natural gas development in rural Colorado*, Environmental Health Perspectives*, vol. 122, April 2014:

"In this large cohort, we observed an association between density and proximity of natural gas wells within a 10-mile radius of maternal residence and prevalence of congenital heart defects and possibly neural tube defects. Greater specificity in exposure estimates is needed to further explore these associations."

Well failure (well barrier and integrity failure) rates in PA

*are more than **one in twenty** (6.5%)*

– Davies, R. et al., Oil and gas wells and their integrity: Implications for shale and unconventional resource exploitation, *Marine and Petroleum Geology*, in press, 2014

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Former Mobil vice-president, Louis W. Allstadt, on well integrity:

There are lots of good indications that plugging the well doesn't really work long-term…And sooner or later the steel casing there is going to rust out, and the cement...is going to crumble. …[E]ven if nothing comes up through the fissures in the rock layers above, where it was fracked, those well bores will deteriorate over time. And there is at least one study showing that 100 percent of plugs installed in abandoned wells fail within 100 years and many of them much sooner.

Waste injected in Ohio 2013

- 16,354,784 barrels = 686,900,928 gallons
- In-state: 8,076,820 barrels
- Out-of-state:

  8,777,964 barrels = 368,674,488 gallons
- Athens County received 699,221 barrels = 29,367,282 gallons
- Of 234 permitted wells, 204 were active.

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Top Seven Receiving Counties 2013

- Trumbull 2,367,037 barrels = 99,415,554 gallons
- Portage 1,976,299
- Washington 1,582,069
- Noble 1,387,789
- Coshocton 1,285,069
- Guernsey 1,231,762
- Athens 699,221

K&H Partners
Troy Township, Athens County

- In 2013, K&H 1 received 550,251 barrels = 23,110,544 gallons.
- Over 440,000 barrels were from out-of state.
- ODNR received $91,964 for this waste, $87,037 of it for the out-of-state waste.
- K&H2, recently permitted, may receive almost three times as much waste as K&H1, putting the total potential *annual* volume for this facility close to **100 million gallons.**

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ODNR permitting and regulatory deficiencies:

- No geological analysis
- No seismic study
- No aquifer mapping
- No verification of a confinement zone
- No monitoring or disclosure of contents or radioactivity levels of injectate
- No monitoring of drinking or groundwater after injection to assess migration and contamination

Former Mobil exec, Louis Allstadt:

There are already cases where the methane gas has made it up into the aquifers and atmosphere. Sometimes through old well bores, sometimes through natural fissures in the rock. What we don't know is just how much gas is going to come up over time…It's not just what's happening today. We're opening up channels for the gas to creep up to the surface and into the atmosphere. And methane is a much more potent greenhouse gas in the short term (less than 100 years) than carbon dioxide.

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Cornell professor, Anthony Ingraffea:

All the current consensus climate science…says that we only have about 20-30 years before we reach the warning zone of temperature rise that could lead to climate tipping points. And we can't wait 20-30 years to START decreasing CO2eq emissions from fossil fuels. Over a 20-year period, the consensus impact factor for methane is about 80 [times more powerful a ghg than CO2], and some peer-reviewed estimates say it could be over 100. There is NO scientific justification for the use of a 100-year period [by agencies evaluating ghg implications of increasing use of "natural"gas].

- "When one looks at the coal-methane tradeoff for electricity generation, the break-even leak rate over a 20-year period is less than 3%." – Anthony Ingraffea

- Methane leakage rates from fracking may be as high as 17%, according to recent research published in the *Journal of Geophysical Research* (Peischl, 2013).

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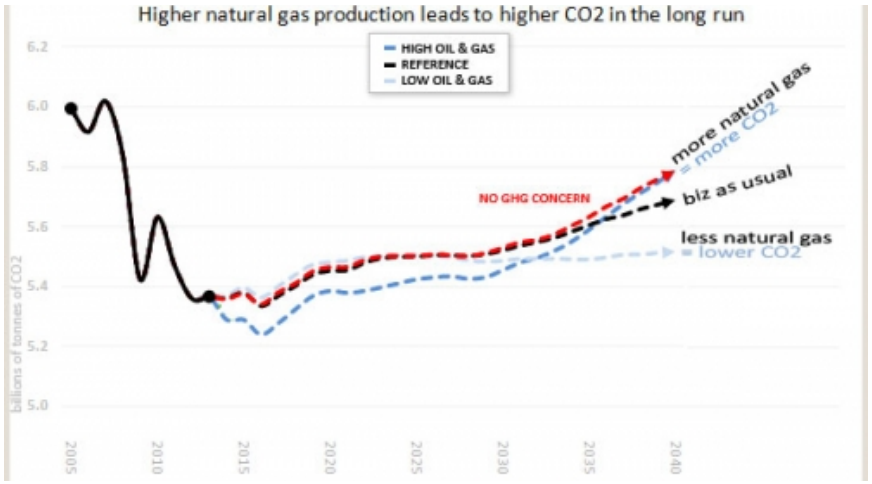
U.S. Energy Information Administration, *2013 Energy Outlook:*

Although more abundant and less expensive natural gas in the High Oil and Gas Resource cases does lead to less coal use and more natural gas use, it also reduces the use of renewable and nuclear fuels and increases energy consumption overall.

— U.S. Energy Information Administration, *2013 Energy Outlook*

Fracking in America kills off clean energy, leading to higher emissions: EIA report,
Barry Saxifrage 3-28-14
VancouverObserver.com



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International Energy Agency Executive Director,
Maria van der Hoeven:

Indeed, under a modeling scenario…in which global natural gas demand increases by 50% between 2011 and 2035, global energy-related CO2 emissions follow a path that is consistent with a long-term temperature rise of **over 3.5 degrees Celsius**…So while the foundation may have been laid for a "golden age of gas," this would not be a golden age for climate.

Indeed, for countries with cheap, abundant gas supplies that are committed to fighting climate change, there will be a need for policies to defend truly low-carbon energy sources from the economic pressures of gas.

— iea.org/newsroomandevents/speeches/140220TechnologyMITspeech.pdf

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ACFANohio AT gmail.com

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