“TOO DIRTY, TOO DANGEROUS”

Why Health Professionals Reject Natural Gas

Based on a report by Physicians for Social Responsibility

2017
This is what the energy future can look like

Clean, renewable sources and energy efficiency:

• Zero emission of climate pollutants
• Zero fuel combustion => Health threats dramatically reduced
• Vulnerable populations protected
• Jobs created
Using fossil fuels, we won’t get there.

- Fossil fuels emit deadly pollutants, heat-trapping gases
  - Coal and natural gas
- Utilities moving to replace coal-fired power plants with natural gas (methane)
- But…
What’s the problem with natural gas?

• Too Dirty
  • Toxic air, water, land contamination, especially from fracking

• Too Dangerous
  • Potent climate change driver -- worse than coal?
  • Climate change endangers health and survival
Too Dirty: Quick Overview of Fracking Process

Heavy industry, often in rural areas

- clearing & drilling
- chemicals, sand, huge volume of water
- forced underground at high pressure
- breaks rock, gas flows up, is captured (or vented or flared)
- wastewater
- some onsite processing
- transport via pressurized pipelines

shipped via pressurized pipelines
Too Dirty: Frac Sands

- Frac sands = silica
- Injected into fracking wells where it serves as “proppant”
- Fracking industry uses huge quantities per well
- People who work in silica mines and in fracking sites can be exposed to silica dust

Frac Sands Mine in MN
Too Dangerous: Health Effects from Silica Dust

- Exposure to silica dust can cause:
  - **Silicosis**, incurable lung disease with no effective treatment;
  - **Lung cancer**

- Cited by NIOSH as a threat to workers in fracking operations where silica sand is used

- NIOSH noted (2015) that silicosis death rates are rising again, reversing an earlier, decade-long decline.
Too Dirty: Toxics We Put into the Earth

• What’s in fracking fluid:
  • known human carcinogens (benzene, toluene, arsenic)
  • neurotoxics (ethylene glycol, lead)
  • endocrine-disrupting chemicals
  • ...and more

• What we don’t know: “proprietary business information”

• Contaminates huge volumes of water
Too Dirty: Contaminants We Pull out of the Earth

Wastewater can contain naturally occurring contaminants:

- salts
- radioactive materials
- heavy metals
- PAH’s
- volatile organic compounds

(Drilling fluid splashing past the liner, Dimock, PA, Spring 2009)
Too Dirty: Fracking-Related Air Pollutants

**Volatile organic compounds**
- Emitted across the natural gas supply chain
  - can cause cancer, affect the nervous system, cause birth defects
  - Contribute to formation of ground-level ozone (smog)
    - can cause irreversible lung damage, significantly increase risk of premature death

**Particulate matter**
- Emitted by trucks, diesel motors
- Causes decreased lung function, aggravated asthma symptoms, nonfatal heart attacks, high blood pressure
- Children particularly vulnerable to lung effects: decreased lung function, worsening asthma symptoms, chronic bronchitis
- Long-term repeated exposure associated with cardiovascular disease, death
What the science shows: dangerous exposures

- Uintah County, UT, one of highest-producing oil and gas fields in US: **dangerously high levels of VOCs and ozone.**

- **Colorado, dangerous airborne levels of benzene**

- **Excessive amounts of ambient benzene, carbon disulfide** near gas drilling operations in northern Texas.
What the science shows: Health outcomes

- 2015: Statistical association between well density and increased rates of hospitalization for cardiac, neurological, urological, cancer-related and skin-related problems.

- 2016: Statistical association between the patient’s proximity to natural gas fracking operations and progressively worsening asthma symptoms.
What the science shows: Health outcomes, cont.

- 2014: Statistical association between density and proximity of natural gas wells within a 10-mile radius of mothers’ residence, and the prevalence of **congenital heart defects**.

- 2016: Statistical association between expectant mothers living in most active fracking areas, and **increased risk of premature birth**.
Too Dangerous: Climate Change

- Over 20-year timeframe, methane is 86x more potent than CO₂

- 20 years = “window of opportunity”
  - If world temperatures increase more than 1.5°-2°C, likely to melt permafrost...
  - …releasing vast quantities of stored methane and CO₂

- Climate change tipping point
Too Dangerous: Methane leaks

Methane leaks from wellsites:

• Methane leaks from fracking wells
  • the well head
  • wellsite and processing equipment

• Deliberate releases by venting
Too Dangerous: Long-Term Leakage from Abandoned Wells

- 3 million abandoned wells

- 5% leak immediately;
  50% after 15 yrs;
  60% after 30 yrs.
Too Dangerous: Leaks from Pipelines

Pipelines carry methane leaks far from wellsites:

- transport pipelines
- compressor stations
- storage facilities
- delivery pipelines
Leaks in Urban Areas

- Leaks under city streets
- Distribution to end-user (that’s you and me)
- Transmission, distribution and end use in Boston study:
  - areas that consume gas “may... represent areas of significant resource loss.”
How Much is Leaking in All?

- Hotly debated
  - Estimates arrange from 0.2 – 10%
  - Texas shales: 9.1%, 10.1%
  - High end: 12%

How much is too much?

- 3.2%

- 2.4 - 3.2%
Climate Pollution: Methane vs. Coal

- No scientific consensus
- Complex comparison
- Timeframe matters

- *Both* increase climate change and harm human health
Methane Blocks the Clean Energy Future

Natural gas plant lifespan: 40 years – too long

- Extends fossil fuel use beyond sustainability
- Delays introducing wind, solar, geothermal options
- Postpones transformation of our energy system
Clean Energy

- Virtually no climate pollution
- No burning
- Sustainable
- Affordable
- Health, survival

For more information:
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and
psr.org/resources/too-dirty-too-dangerous.html