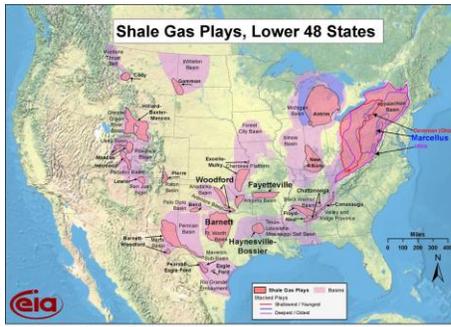


## Gas Guilt

by William Menke, February 2012



An environmental journalist asked me whether he should feel guilty about switching to natural gas, given the concern people are having about gas shale and hydrofracturing. Here's my take on this question.

Gas shale is a new source of natural gas, one that has only been exploited minimally to date, but one that might potentially supply a substantial percentage of that fuel. Some environmentalists (including me) have argued that we should explicitly choose *not* to exploit any new sources of fossil fuels (coal, oil and natural gas), so as to facilitate the development of renewable energy (wind and solar). New sources that we would choose to set aside would include gas shale, tar sands (as in Athabasca) and conventional petroleum in unexploited regions such as the Arctic. The underlying logic is that fossil fuels, through the CO<sub>2</sub> that their combustion releases, are damaging the climate system, and that it would be damaged less by our investing in non-CO<sub>2</sub> releasing alternatives now rather than later. If you feel that switching your house to gas promotes expansion of the gas industry into oil shale, you should *feel guilty*. Note, however, that any decision not to exploit gas shale must be made as a matter of public policy, as it goes counter to market forces. You could still support the adoption of such a policy, even if you use gas, because right now most gas comes from well-developed traditional gas fields. You just need to be willing to let them run out.

On the other hand, the combustion of natural gas emits less CO<sub>2</sub> per unit of energy than does coal or oil, because a larger percent of the combustion products are water. If you believe that your switching to gas will somehow translate into less coal and oil being burned overall, then you should *not feel guilty*. However, whether your switch really impacts world consumption patterns – even to a tiny degree - is unclear, especially since even you use coal (in the form of electricity) and oil (in the form of gasoline), too. If the money you save switching to gas translates into higher electrical usage (say because you purchased a wide-screen TV with your savings), your switch may not really lead to reduced CO<sub>2</sub> emissions. The economics of energy costs are complicated and the feedbacks are poorly understood.

The issue of the effect of shale gas extraction on water quality is less straightforward, both because water potentially can become contaminated in several ways, and because the extraction is an industrial process like any other whose impact is always less when done right than when done sloppily. Shale gas is extracted from shale, a relatively impermeable rock that typically occurs deeper in the earth than drinking water. Drinking water contamination occurs when the substances that either occur naturally in the shale or have been added to it as part of the extraction process move upward into the shallower aquifers that are exploited for drinking water. Considerable focus has been on hydrofracturing (“fracing”) as the culprit. This process induces cracks in the shale along which both gas and more undesirable substances can move, including substances that are introduced during the fracing, itself (and which need to be better regulated). But, actually, there is little evidence that such cracks connect to shallower aquifers. The boreholes, themselves, provide a much more significant pathway for pollutants, especially if the steel liner (“casing”) has been poorly cemented (“grouted”) in. Pollutants are then free to percolate up between the rock and the casing and flow from a deep level to a shallower level where it can mix with drinking water. The disposal of the waste water that is an incidental byproduct of the gas extraction is also problematical. It often contains naturally-occurring pollutants such as lead and arsenic. It cannot just be dumped into streams but must be collected and disposed of properly. We know how to do all of this right. Whether or not you *feel guilty* depends on whether you believe that, when properly regulated, it will be done right.

By the way, your car contains about fifty pounds of lead and (with a full tank of gas) about one hundred and fifty pounds of carcinogenic hydrocarbons. How worried are you that it is contaminating your driveway or garage? Perhaps familiarity breeds contempt?

Finally, oil gas extraction is an industrial activity that requires, in addition to the well-heads themselves, roads wide enough for trucks and drill rigs, parking lots, gas pipelines, waste-water storage tanks, electrical transmission lines, and so forth. A patch of countryside from which shale gas is being extracted is not going to look like a picture-postcard farm or scenic woodland. You could *feel guilty* about ruining the landscape. But then again, you’re not the person who signed the lease.