

The Fracking Controversy

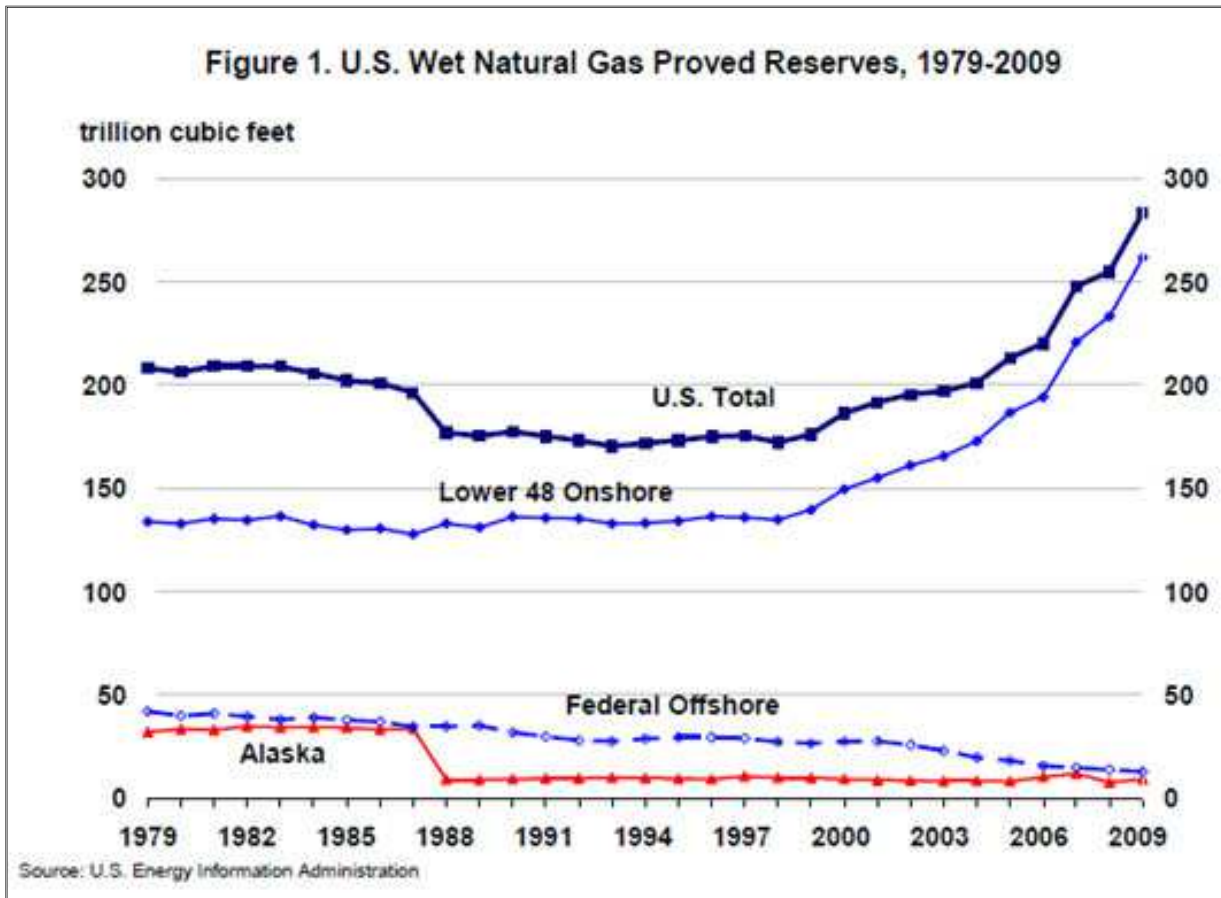
By The Casey Research Energy Team

The news that Blackstone Group LP (BX), the world's largest private equity firm, is set to invest \$1 billion in unconventional oil and gas projects in North America through a joint venture with Alta Resources has cemented a spotlight on fracking.

A U.S. Senate committee is currently conducting a hearing on the safety of hydraulic fracturing, as it is formally known. The province of Quebec, the state of New York, and the entirety of France have recently banned the technique. And two new studies claim that fracking-derived shale gas is actually worse for the environment than mining and burning coal. With so many claims flying around about this unconventional practice, let's get a closer look at the facts.

Fracking is a drilling technique that involves pumping large volumes of water, sand and chemicals into deep shale deposits to fracture the rock and free the oil or gas. Drillers seeking to pull more oil and gas from hard rock deposits have been fracking since the 1950s, but in the last decade advancements in horizontal drilling techniques have taken fracking to a new level.

Fracking has enabled us to extract gas from shale deposits, which are often more than a mile underground. The gas in these deposits used to be inaccessible, but now that it can be extracted, and as a result, shale gas has transformed the North American natural gas landscape. In the chart below, the increase in Lower 48 onshore production over the last 10 years stems primarily from shale gas discoveries.



Shale gas deposits now provide 25% of America's natural gas and are expected to provide 45% by 2035. In 2010, the nation produced 4.87 trillion cubic feet of shale gas, a 57% increase from in 2009. Shale gas discoveries accounted for 90% of the increase in America's domestic gas reserves in 2009 - a year when gas reserves grew by 11% even though prices fell by a third - and shale gas now represents 21% of the nation's total gas reserves.

The dramatic shift to shale gas has three drivers. First, horizontal drilling advanced to a level where drillers became able to frack horizontally. Fracking has been used to extend the lives of vertical wells since 1949, but vertical fracturing cannot retrieve shale gas at economic levels. Horizontal fracking can.

Second, the world's easy-to-reach, conventional gas fields are starting to run dry. That precipitated an increase in the price of natural gas. When a commodity is worth more, companies become willing to spend more finding it, and thus was born today's frantic fracking campaign.

Third, the United States hates that it is reliant on OPEC oil. When fracking revealed a wealth of domestic natural gas, that natural gas quickly became the "bridge fuel" in the nation's energy plan, a cleaner-burning fuel than oil or coal that the country can use to wean itself off foreign oil as it transitions to renewable energy sources. Natural gas exploration has almost been cast as an act of patriotism.

It has also found major support from the federal government. President Obama has promoted natural gas as part of America's clean energy future, but the real support for fracking came from President Bush. In 2005, the Bush administration drafted and passed the Energy Policy Act, a wide-ranging energy bill crafted by Vice President Dick Cheney. (It is relevant to note that Dick Cheney ran Halliburton, the company that pioneered fracking and is highly active in U.S. natural gas exploration, before joining politics.)

The Energy Policy Act explicitly exempted fracking from the requirements of the Safe Drinking Water Act, the Clean Air Act, and the Clean Water Act. The Halliburton Loophole, as it has become known, enables gas companies to pump millions of gallons of fracking fluid into old wells or to leave the fluid evaporating in open pools, without having to identify the chemicals in the fluid. Those chemicals include benzene, toluene, boric acid, xylene, diesel-range organics, methanol, formaldehyde, and ammonium bisulfite.

It is this fracking fluid that causes the most concern. It takes up to 8 million gallons of water to frack a well, and a well may be fracked up to 18 times. With each round, about half of the fracking fluid returns to the surface along with the gas, via the collection pipes. The gas is piped to compressor stations, where it is purified and compressed for transport. The returned fracking fluid, now called wastewater, is either trucked to water treatment plants that may or may not be designed to handle fracking chemicals, reinjected into old wells, or stored in large, tarp-lined pits, where it is allowed to evaporate.

It is no great surprise that the rapid growth in fracking has been matched by an equally rapid growth in opposition. The wells themselves are eyesores for some; to build the roads and drill pads, hundreds of thousands of acres of land have been disrupted. However, the big issue is water contamination. As use of the technique has spread, it has been followed by thousands of incidents of water contaminated by metals and volatile organic compounds that have led to health problems for people, livestock and wildlife.

The natural gas industry claims that the one million currently producing, hydraulically fractured wells in the United States were drilled without causing a single confirmed case of groundwater contamination. That is not true. In Pennsylvania, the Department of Environmental Protection acknowledged a contamination of the aquifer that fills household wells in a rural area of Dimrock after more than 60 wells were drilled in a 9-square-mile area.

The fracking operations turned the water brown and imbued it with dangerously high levels of methane, iron and aluminum. Fracking fluids leaked into streams, turning them garish colors and killing fish. One woman's water well blew up. A family was evacuated from their house because of dangerous methane levels.

Shale formations are typically 5,000 to 8,000 feet deep, way below groundwater aquifers that usually sit just 1,000 feet below surface. As such, it is not likely that the frac gas and fluids travel all the way up to the aquifers through fractures. Contamination more likely occurs through poor cement well casings that allow fracking fluids and methane to escape all the way up the pipe, including at groundwater levels.

In addition, since the Halliburton Loophole exempts fracking from abiding by most environmental regulations, the above-ground handling of return wastewater and the airborne pollution produced through processing add significant risks to the fracking process. For example, Fort Worth, Texas, sits atop a very productive shale formation. Chemical emissions from natural gas processing facilities in and around Fort Worth now match the city's total emissions from cars and trucks.

Fracking still enjoys wide-ranging support, for good reasons. The lease fees that drilling companies pay to landowners are enough to turn many citizens into supporters. The price to lease an acre of Marcellus Shale, the huge shale play that stretches from West Virginia to New York, continues to climb. Twenty years ago, it was just \$25; now it averages \$5,000. The industry creates thousands of jobs and pumps lots of money into state coffers. And it provides natural gas, the clean energy of our near-term future. Right? Well, maybe.

The part that may not be right is the "cleanliness" of natural gas. Two new studies out of Cornell University are poking holes in natural gas' clean-and-green reputation, suggesting that the rush to develop America's unconventional gas resources will likely increase the nation's carbon emissions rather than decrease them.

Natural gas is considered clean because, on combustion, it emits roughly half the carbon dioxide of coal and about 30% that of oil. The problem, according to lead author Robert Howarth, is that combustion is only one part of the natural gas life cycle; during other parts of the cycle, a lot of methane is lost.

The study suggests that between 3.6% and 7.9% of the methane in natural gas is lost from the time a well is plumbed to when the gas is used. On top of that, a recent study from the Goddard Institute for Space Studies at NASA suggests an interaction between methane and certain aerosol particles significantly amplifies methane's already potent greenhouse gas effects. In addition, thousands of trucks are driving every minute of every day to bring fracking fluid to drills and to remove wastewater. When all is factored in, Howarth and his colleagues conclude the greenhouse gas footprint of shale gas is likely 20% greater than coal per unit energy, and may be as much as twice as high.

There are many caveats in the study. The data Howarth used was thin, by his own admission, in large part because the industry discloses so little. And much of the methane now leaking out of shale gas operations should be relatively easy to seal in. But if nothing else, the study should give lawmakers reason to pause before continuing their wide embrace of all sources of natural gas.

Along those lines, many people oppose the overall concept of a bridge fuel. The question is: how long and wide should the bridge be? And if Howarth is right and shale-derived gas is worse for the environment than coal and oil, should shale gas be part of the bridge?

These are the questions that governments around the world are wrestling with. In the U.S., a Senate Environment and Public Works Committee is currently hearing testimony in an effort to assess the safety of hydraulic fracturing. The Environmental Protection Agency (EPA) is also studying fracking, under orders from Congress. The EPA study is a comprehensive look at whether fracking taints water supplies, and initial results are not expected until 2014.

Some jurisdictions are not waiting for official study results. New York City and Syracuse, New York, have banned fracking in their watersheds, citing a study that concluded fracking could pose "catastrophic" risks to the prized local water supply. New Jersey is considering a ban, and Pittsburgh has prohibited the practice

within city limits. The Canadian province of Quebec recently banned fracking completely, even though the province hosts considerable shale gas potential. In Australia, fracking has been sweeping the Queensland countryside, and a furor is building among landowners. Shale exploration is similarly spreading quickly and causing strife across Europe.

Nevertheless, Blackstone's \$1 billion entry into the field suggests fracking is still a hot topic. Blackstone is not the only major making a major shale splash: a year ago, Indian materials and energy giant Reliance Industries struck a deal with Pennsylvania-based Atlas Energy to team up in developing Atlas' more than 500,000 acres of Marcellus land. The deal is worth \$1.7 billion over five years, or \$3.5 billion over 10 years.

So what should the investor do? **First, it is not important to decide whether or not fracking is damaging to people and the environment.** The Senate committee and the EPA are working on that (albeit through numerous politicians and lobbyists - good luck to them). What the investor needs to do is the same as always: separate the wheat from the chaff.

In that analysis, remember these points.

1. Unconventional exploration, including fracking, is a phenomenon that will forever change the face of hydrocarbon exploration. We applaud those trying to find new ways to tap into the earth's resources.
2. Natural gas prices are depressed because of oversupply in North America. Oil prices, on the other hand, are high. If you want exposure to unconventional exploration, choose a company that is working in both areas, or potentially just in unconventional oil. You rarely win when you're fighting against a low commodity price.
3. Every successful development in exploration attracts bandwagoners, companies that want to ride the wave even though they are not really involved in the action. Check maps to verify a company's land position is actually within the basin in question; check cash balances to see if the company has enough money to drill. Do your due diligence.
4. Where there are congressional committees and controversy, laws are apt to change. Fracking is coming under considerable scrutiny at the state and federal levels, so keep your eyes peeled for news about challenges or change to the regulations governing fracking.

While oil and gas companies can be terrific profit opportunities, rising prices also create opportunities in the renewable sectors, making them more economic. Learn which "green energy" is not only more viable and cheaper than solar and wind, but **can also provide investors with stunning gains** - it's so great, even Warren Buffett has a stake in it. [Get the details here.](#)