

Connecticut Debate Association

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Joel Barlow High School

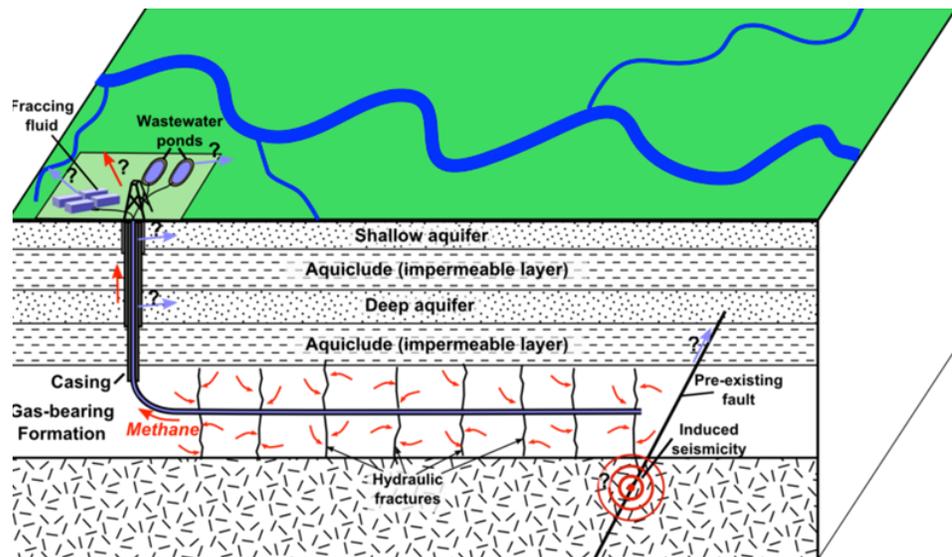
Resolved: Cities and towns should have the final decision on whether to permit drilling and “fracking” for oil and natural gas.

Hydraulic fracturing

From Wikipedia, the free encyclopedia

Hydraulic fracturing is the propagation of fractures in a rock layer by a pressurized fluid. Some hydraulic fractures form naturally -- certain veins or dikes are examples -- and can create conduits along which gas and petroleum from source rocks may migrate to reservoir rocks. Induced hydraulic fracturing or hydrofracturing, commonly known as fracing, fraccing, or fracking, is a technique used to release petroleum, natural gas (including shale gas, tight gas, and coal seam gas), or other substances for extraction.[1] This type of fracturing creates fractures from a wellbore drilled into reservoir rock formations.

Proponents of hydraulic fracturing point to the economic benefits from vast amounts of formerly inaccessible hydrocarbons the process can extract.[4] Opponents point to potential environmental impacts, including contamination of ground water, risks to air quality, the migration of gases and hydraulic fracturing chemicals to the surface, surface contamination from spills and flowback and the health effects of these.[5] For these reasons hydraulic fracturing has come under scrutiny internationally, with some countries suspending or banning it.[6][7]



With Ban on Drilling Practice, Town Lands in Thick of Dispute

The New York Times, November 25, 2012, By [JACK HEALY](#)

LONGMONT, Colo. — This old farming town near the base of the Rocky Mountains has long been considered a conservative next-door neighbor to the ultraliberal college town of Boulder, a place bisected by the railroad and where middle-class families found a living at the vegetable cannery, sugar mill and Butterball turkey plant.

But this month, Longmont became the first town in Colorado to outlaw hydraulic fracturing, the oil-drilling practice commonly known as fracking. The ban has propelled Longmont to the fiercely contested forefront of the nation’s antifracking movement, inspiring other cities to push for similar prohibitions.

But it has also set the city on a collision course with oil companies and the State of Colorado.

“People really didn’t think through this too well,” Mayor Dennis L. Coombs said, sounding weary at the prospect of an onslaught of lawsuits. “We are where we are. I guess you have to respect the people.”

In a way, Longmont’s fracking ban is in a position similar to Colorado’s ballot measure legalizing small amounts of

marijuana for recreational use. Both are lessons in the promise and peril of populism: both initiatives sailed through on Election Day despite opposition from the authorities, and both now face legal scrutiny and fights at all levels of government.

Gov. John W. Hickenlooper, a Democrat, has warned Longmont residents that the ban is likely to mean a lawsuit from the state, which insists that only it has the authority to regulate drilling. Already this summer, Colorado [sued](#) Longmont over earlier city rules that limit drilling near schools and homes.

Local leaders are also bracing for more lawsuits as they tell energy companies they can no longer frack their wells — a process that involves injecting thousands of gallons of pressurized water, sand and chemicals deep into the earth to fissure the rock and extract the oil and gas locked inside.

The ban does not outlaw all drilling, only the specific practice of hydraulic fracturing within the city limits, as well as the storage and disposal of waste created by the process.

“We’re going contrary to state laws,” said Bill Swenson, one of [seven former mayors](#) of Longmont who fought the ban. “We are, in effect, taking your property.”

Fracking has allowed drillers to unlock huge new reservoirs of oil and natural gas over the past few years, and has kick-started economies from North Dakota to western Pennsylvania to here in northern Colorado. The industry says the practice is environmentally safe, but opponents have raised concerns about water contamination and air pollution while objecting to islands of well pads and forests of drilling towers in their communities.

The [Colorado Oil and Gas Association](#), the main lobbying group for the energy industry here, criticized the ban as confrontational and encroaching on the private property of companies that have rights to oil and gas buried deep beneath Longmont’s streets, parks and reservoirs.

“Are the taxpayers of Longmont prepared to provide fair compensation to all of the oil and gas lease holders in Longmont?” said Tisha Schuller, the group’s president.

[Supporters of the ban](#) call it a “citizen uprising” against a rush of drilling that has spread like brush fire through towns across the plains of northern Colorado.

In nearby Firestone, wells sit within a few hundred feet of libraries, schools and subdivisions. In Greeley, herds of tanker trucks line up at city fire hydrants at dawn to load [water for fracking](#). Earlier this year, a federal scientist reported finding elevated levels of propane and benzene in the air around Erie. City officials and environmental advocates have even led [fracking tours](#) of communities where drilling is at its peak.

When people learned of plans to sink wells in Longmont near the Union Reservoir and a playground and recreational area on the east end of town, a response began to coalesce: not here. Supporters said the state’s decision to sue over Longmont’s regulations stiffened their resolve.

At the start, the ban seemed like a doomed idea.

The energy industry poured money and resources into fighting it, raising more than \$500,000 to send out mailers and buy advertisements saying the ban would drive away businesses and incite expensive court battles. The major newspapers in Denver, Boulder and Longmont all urged voters to reject the proposal.

“I had no idea we could upset an entire state government and a trillion-dollar industry,” said Michael Bellmont, an insurance agent who helped gather thousands of signatures and knocked on doors to persuade voters.

Advocates of the ban focused less on climate change and environmental concerns than on hitting voters where they lived: Do you want oil wells venting near your backyard? Do you want drilling near your schools?

The industry said the arguments were based on fear-mongering, deception and antifracking hysteria, but they resonated with voters. The ban passed 60 percent to 40 percent, with broad bipartisan support.

One recent afternoon, a few supporters who helped get the ban passed drove through town to visit some of the “red sites” — areas that had been leased for drilling, or could be in the future. They drove past public parks, open spaces and golf courses and stopped at the Union Reservoir, still and limpid under a cloudy sky.

“There’s a swim beach, there’s sailing, and there will be eight well pads,” said Kaye Fissinger, a supporter of the ban, pointing out potential drilling sites in the distance. “You come out here to relax. You don’t come out here to have your air polluted.”

U.S. News: Towns Fight Against Drilling

By Daniel Gilbert and Russell Gold, 4 April 2012, The Wall Street Journal

States hoping to capitalize on their energy booms are running into resistance from local officials who want to be able

to police the noise and industrialization that accompany oil and gas drilling.

The municipalities are fighting laws that bar them from regulating drilling, enacted by state lawmakers who feared towns would stunt job-creation and a stream of tax revenue.

Last Thursday, seven towns collectively sued Pennsylvania in state court to overturn a law passed in February that prevents them from using their zoning authority to regulate oil-and-gas development. The day before, an Ohio state senator introduced legislation to grant local officials more control over where companies can drill.

Also late last week, an energy company and a landowner appealed rulings in New York state courts that towns can use their zoning power to ban gas-drilling, despite a state law that prevents them from regulating the industry. The state has temporarily blocked companies from drilling in the Marcellus Shale while regulators weigh the environmental impact.

The balance between local land-use regulation and energy development has been hard to strike in Pennsylvania, which is carved up into more than 1,000 townships, some of which worry about how drilling would affect traffic, property values and public health.

The new state law is an "unacceptable, special-interest power grab," said Jonathan Kamin, solicitor for one of the municipalities suing the state, the township of South Fayette, which is in the state's southwest corner.

The 117-page suit charges that Pennsylvania has overstepped its constitutional powers by foisting a uniform standard on all localities, upending existing ordinances and development plans.

A spokesman for Pennsylvania Gov. Tom Corbett said the governor hadn't seen the lawsuit but that the administration "worked closely with local government associations" in crafting the law, and was confident it would survive the challenge.

America's Natural Gas Alliance, an industry group, favors statewide rules. Many local governments "want to change the rules under which we operate after we've made investments, and that makes for a difficult situation," spokesman Dan Whitten said.

The tension in these states stands in contrast to Texas, where local officials have the longest experience with drilling into shale formations and have created some of the strictest rules in the U.S. Fort Worth issued the first municipal ordinances governing gas drilling inside city limits in 2002, including a requirement that wells can't be closer than 600 feet to homes, a standard widely adopted in Texas.

Most Texas localities have adopted ordinances to minimize disturbances and protect homeowners, not to ban drilling. They require sound barriers and limit hours of drilling. A handful of communities in North Texas require companies to take water samples before drilling and even do air-quality testing.

Ron Robertson, the mayor of Bartonville, north of Fort Worth, said modifications to the town's ordinance last October were designed to "hold the fracking company responsible" if something went wrong. "We are a rural ranch community, and the majority of our citizens are leaseholders," he said.

Other towns have gone further. Southlake, Texas, decided last year to keep its 1,000-foot buffer rule, first adopted in 2008. That led Chesapeake Energy Corp. and Exxon Mobil Corp., the nation's two largest natural-gas producers, to abandon plans to drill there. Chesapeake, in a November letter to residents whose mineral rights it had leased, called the rules "unnecessary and restrictive."

State officials in Ohio and Pennsylvania are eager to avoid similar situations. As Pennsylvania lawmakers were hashing out an oil-and-gas law in November, Mr. Corbett, the Republican governor, emphasized the need to match Ohio's law, which stripped away local governments' authority to regulate the industry.

"As they continue to attempt to lure Pennsylvania jobs and investment across our western border into Ohio, they most often point to the predictability in standards and rules," he wrote to a state senator in a letter reviewed by The Wall Street Journal.

Ohio's law has fueled anxiety among some local governments as companies ramp up drilling in the Utica Shale there. Last week, state Sen. Capri Cafaro, a Democrat, introduced legislation to rescind the exclusive authority of state officials to regulate oil and gas, and to require drillers to comply with local zoning rules.

Rick Simmers, who heads the state's oil-and-gas division, said Ohio's safety standards are among the strictest in the U.S. He said his staff considers the input of local officials when issuing a drilling permit, but pays little heed to their preferences about where companies can drill.

Rush for Gas Rights Ignites Battles for Control of Land

By SABRINA TAVERNISE, The New York Times, December 14, 2011

SOUTH FAYETTE, Pa. — As energy companies move to drill in densely populated areas from Pennsylvania to Texas, battles are breaking out over who will have the final say in managing the shale gas boom.

The fight, which pits towns and cities against energy companies and states eager for growth, has raised a fundamental question about the role of local government: How much authority should communities have over the use of their land?

The battle is playing out in Pennsylvania as the Republican-controlled legislature considers bills that would in their current form sharply limit a community's right to control where gas companies can operate on private property. Critics say the final bill could vastly weaken local zoning powers and give industry the upper hand in exchange for a new tax, which municipalities badly need.

The legislation has struck a nerve in a state where land control has long been considered quintessentially local.

"I'm a conservative Republican, and this goes against all my principles," said Brian Coppola, the chairman of the Board of Supervisors of Robinson Township, in Washington County west of Pittsburgh. The pending legislation, he said, "is an enormous land grab on the part of the industry. He added, "Our property rights are being trampled."

Mr. Coppola noted a hillside in town that began to crack and slide under the weight of a new shale gas processing plant, which he contends was built without a permit. The town's zoning powers allowed him, through a court, to compel the company to follow town regulations and allow town inspectors access to the site. The site was eventually stabilized. Losing those powers would leave local officials out of the equation, he said, even though they are responsible for protecting the health and safety of their citizens.

"I'm an unpaid, part-time elected official, and it's been a nightmare," he said. "The state is not capable of monitoring even the most basic parts of this industry."

Local governments argue that drilling is an industrial activity, just like that of a gas station or a cement factory, that should be subject to zoning. Dozens of towns, cities and counties across the country have enacted rules on drilling noise, lighting and the distance from homes and, in some cases, outright bans. In New York State alone, there have been at least 70 such actions.

Companies say the rush to regulate has produced an overly burdensome set of demands that is denting their potential when the economy desperately needs a lift.

"It's like having to get a different driver's license in every town," said Matt Pitzarella, a spokesman for [Range Resources](#), a Texas drilling company that is active here.

The flurry of local rules comes as the federal government inches forward on a national study of hydraulic fracturing, also known as fracking, the process used to extract previously inaccessible [natural gas](#) from shale deep underground.

The study is expected to shape the future of the industry, but progress has been slow. In the meantime, courts have become the next frontier.

In New York in September, a Denver exploration company sued Dryden, a town near Ithaca, over a drilling ban. In Colorado, Gunnison County, which contains a ski resort, is fighting a drilling company's court challenge to its zoning. In Texas, a restrictive gas drilling ordinance adopted by an affluent suburb of Dallas called Flower Mound has drawn several lawsuits charging that it amounts to an unconstitutional seizure of mineral rights.

Jordan Yeager, a Pennsylvania lawyer who represents municipalities, said litigation brought by gas companies had a chilling effect, discouraging towns and cities from enacting regulations because they cannot afford to defend them in court.

Supporters of the Pennsylvania legislation argue that it would hold the industry to higher, more uniform environmental standards in addition to charging them fees.

"We substantially raised the bar of what we expect from natural gas operators," said Representative Matthew Baker, a Republican who helped shape the legislation.

[Emily A. Collins](#), a professor of environmental and [oil](#) and gas law at the University of Pittsburgh, said parts of the legislation would help the environment — for example, expanding the distance in which a driller could be presumed responsible for replacing a tainted water supply.

She said the legislation seemed to anticipate litigation, calling for special judges to be added to the state Commonwealth Court, presumably to handle new flows of cases against local governments.

Companies have been ramping up shale gas drilling operations during the past decade in states like Texas and Colorado, and during the past several years in Pennsylvania, where the giant Marcellus Shale formation has set off a

frenzy of activity.

The industry, however, has bumped up against affluent homeowners concerned about possible health effects and their property values. The median household income in Flower Mound, for example, is more than double the national median.

“It used to be that gas development happened ‘out there,’ ” said Gwen Lachelt, the director of the Oil and Gas Accountability Project for [Earthworks](#), a national organization based in Colorado. “Now you see it in urban areas.”

That was the case in South Fayette, a bedroom community of rolling hills and upscale developments in Allegheny County for professionals from Pittsburgh. In August, Range Resources lodged a formal complaint against a zoning ordinance that established distances that drilling pads had to be kept from buildings in residential areas, charging that it went further than state law allows. On Nov. 9, the town rejected that complaint, raising the stakes.

“I spent a lot of money and invested heavily in my home,” said Keith McDonough, a resident who is an executive at a clothing company. “I don’t want to see it go up in smoke on a fracking site.”

Mr. McDonough, who described himself as a die-hard Republican, said he was finding himself doing things he had never done before, like knocking on doors and circulating petitions.

William Sray, a farmer who has signed a lease with a gas company, argued that by delaying drilling, opponents were denying his right to fulfill his contract and collect royalties. “Everybody has property rights, but they’re not respecting mine,” he said.

Mr. Pitzarella, of Range Resources, said that only a small minority of towns in Pennsylvania’s Marcellus Shale area — about 80 of approximately 1,800 — had, or were developing, regulations and that most of them were affluent. A strong set of state standards that people agree on would protect all communities, he said.

“It’s about having predictable and enforceable regulation that works for everyone,” he said.

But local regulation of oil and gas development is very strong in Texas, Professor Collins said, and has not seemed to hamper the industry’s growth. Fort Worth, for example, issues its own permits for drilling, something that states typically do.

Mr. Coppola argued that the most immediate risk in Pennsylvania was the possibility that companies, which are not required to share infrastructure like pipelines and compressor stations, could erect multiple sets, driving away developers and affluent residents and reducing the tax base.

Mr. McDonough was hopeful. He said towns would not make the same mistake they did with the [coal](#) industry. A river in town still runs orange, even though the industry is long gone.

“We’re at a turning point,” he said. “If this is not done with common sense, we will have lost an entire way of life.”

Vast Oil Reserve May Now Be Within Reach, and Battle Heats Up

The New York Times, February 3, 2013, By [NORIMITSU ONISHI](#)

FELLOWS, Calif. — Secure in this state’s history and mythology, the venerable Midway-Sunset oil field near here keeps producing crude more than a century after Southern California’s oil boom. Many of its bobbing pump jacks are relatively short, a telltale sign of the shallowness of the wells and the ease of extracting their prize.

But away from this forest of pump jacks on a flat, brown landscape, a road snakes up into nearby hills that are largely untouched — save for a handful of exploratory wells pumping oil from depths many times those of Midway-Sunset’s. These wells are tapping crude directly from what is called the Monterey Shale, which could represent the future of California’s oil industry — and a potential arena for conflict between drillers and the state’s powerful environmental interests.

At one such exploratory site, tall pump jacks stood above two active wells on a small patch of federal land. For now, the operator, Venoco, has been storing the oil in two large tanks. But construction is scheduled to start soon on pipelines, and more wells are planned.

Comprising two-thirds of the United States’s total estimated shale oil reserves and covering 1,750 square miles from Southern to Central California, the Monterey Shale could turn California into the nation’s top oil-producing state and yield the kind of riches that far smaller shale oil deposits have showered on North Dakota and Texas.

For decades, oilmen have been unable to extricate the Monterey Shale’s crude because of its complex geological formation, which makes extraction quite expensive. But as the oil industry’s technological advances succeed in unlocking oil from increasingly difficult locations, there is heady talk that California could be in store for a new oil boom.

Established companies are expanding into the Monterey Shale, while newcomers are opening offices in Bakersfield, the capital of California's oil industry, about 40 miles east of here. With oil prices remaining high, landmen are buying up leases on federal land, sometimes bidding more than a thousand dollars an acre in auctions that used to fetch the minimum of \$2.

"We've seen a significant increase in the last three to five years in the price paid from our sales," said Gabriel Garcia, assistant field manager at the federal Bureau of Land Management's office in Bakersfield. "Some of that has to do with speculation on new technologies, and some of that has to do with the high price of oil."

The Monterey Shale has also galvanized California's powerful environmental groups. They are pressing the state to strictly regulate hydraulic fracturing, or fracking, the drilling technique that has fueled the shale oil and gas boom elsewhere but has drawn opposition from many environmentalists. In December, the State Department of Conservation released a draft of fracking rules, the first step in a yearlong process to establish regulations.

Severin Borenstein, a co-director of the [Energy Institute](#) at the Haas School of Business at the University of California, Berkeley, said technological advances and the high price of oil were driving interest in the Monterey Shale, just as elsewhere.

"Everyone has known that there is shale oil not just in the Monterey Shale but also in North Dakota and Wyoming and all over the country," he said. "Back in the '70s, there were discussions that there's all this oil and all we've got to do is get it. Now 40 years later, the technologies have become available to actually get it in a cost-effective way."

While oil is found less than 2,000 feet below the surface in fields like Midway-Sunset, companies must pump down to between 6,000 and 15,000 to tap shale oil in the Monterey.

Though production has been declining for years, California remains the country's fourth-largest oil-producing state, after Texas, North Dakota and Alaska. So far, little of the crude is derived from the Monterey Shale, whose untapped deposits are estimated at 15.4 billion barrels, or more than four times the reserves of the Bakken Shale in North Dakota, according to the United States Energy Information Administration.

"There are billions of barrels of oil buried in the Monterey Shale, and as far as I know, nobody's been able to find it yet," said Neil Ormond, the president of Petroleum Land Management, a company based in Clovis, Calif. "But I think there's going to be more people looking for it. You can't let a few dry holes discourage the whole thing, because if you find oil, you make money."

A landman, Mr. Ormond bought leases on more than 10,000 acres of federal land in an auction organized by the Bureau of Land Management. Landmen usually work for oil companies, acquiring leases that allow them to explore and drill for oil.

Landmen have also been increasingly approaching individual landowners and buying mineral rights, though these private transactions are hard to track, said Tim Kustic, California's state oil and gas supervisor.

"That's an early precursor to an increase in exploration and drilling activity," Mr. Kustic said.

The two companies with the biggest stakes in the Monterey Shale, Occidental Petroleum and Venoco, are increasing their exploration efforts, including a joint three-dimensional seismic survey of one area.

Companies with experience exploiting the Bakken Shale, including the New York-based Hess, have recently set up operations in Bakersfield, too. Jon Pepper, a spokesman for Hess, said it was "too early to talk in any definitive way" about the company's plans in the Monterey Shale.

But the oil companies' plans for the Monterey Shale are already drawing increasing scrutiny from environmental groups. Though oil companies have engaged in fracking in California for decades, the process was only loosely monitored by state regulators.

The Monterey Shale's geological formation will require companies to engage in more intensive fracking and deeper, horizontal drilling, a dangerous prospect in a seismically active region like California, environmental groups say.

Environmental groups, including the Sierra Club and the [Center for Biological Diversity](#), are suing the Bureau of Land Management and the Department of Conservation to prevent the opening up of further land to oil exploration and to enforce stricter environmental practices.

"If and when the oil companies figure out how to exploit that shale oil, California could be transformed almost overnight," said Kassie Siegel, a lawyer at the Center for Biological Diversity. "Fracking poisons the air we breathe and the water we drink. It is one of the most, if not the most, important environmental issue in California."

Tupper Hull, a spokesman for the Western States Petroleum Association, an industry lobbying group, said oil companies had safely used fracking for decades in California, mostly combined with traditional vertical drilling.

“Nobody can point to any incident or impact that has taken place,” Mr. Hull said.

After the California Department of Conservation released its draft of fracking regulations, environmental groups criticized a clause that would allow companies not to disclose the chemicals used in fracking to protect trade secrets.

Jason Marshall, chief deputy director of the Department of Conservation, said companies seeking to withhold such information would have to adhere to the state’s trade secret protection laws.

“The baseline assumption of these regulations is the disclosure of what’s in the fluids,” he said. “It should be the exception when someone is trying to exercise a trade secret protection.”

Is Fracking Good for the Environment? If only it were that simple.

By Kevin Drum, Mother Jones, Fri Sep. 7, 2012 2:00 AM PDT

Is increased production of natural gas from shale deposits good for the environment? At first glance, yes: natural gas releases less CO₂ into the atmosphere than coal, so replacing coal-fired electrical plants with gas-fired plants is a win for global warming. And since fracking makes natural gas cheaper, it helps stimulate a switch from coal to gas.

But wait: It turns out you also have to account for leakage. The problem is that natural gas is methane, a powerful greenhouse gas in its own right, and when you extract natural gas from shale formations, some of it inevitably leaks out. That’s decidedly bad for global warming. But David McCabe, an atmospheric scientist at the Clean Air Task Force, reports that the news is fairly good on this front: [4] “From the best of the collective work, we believe that burning natural gas for electricity produces about 30-50% less greenhouse gas than burning coal, even accounting for the emissions of methane (and carbon dioxide) from producing and transporting the natural gas.”

Unfortunately, the story doesn’t stop there, and it gets a lot grimmer as you dig deeper. The problem is simple: If you make something cheaper, people will use more of it. In the case of natural gas, this is fine as long as people are using more of it as a substitute for coal. But that accounts for only a small fraction of natural gas usage:

Less than a third of natural gas is used for electrical generation. Cheap gas will mean more consumption by buildings, industry, and perhaps for transportation. In many of these sectors, cheap gas won’t edge out coal or any other fuel. We’ll just burn more of it.

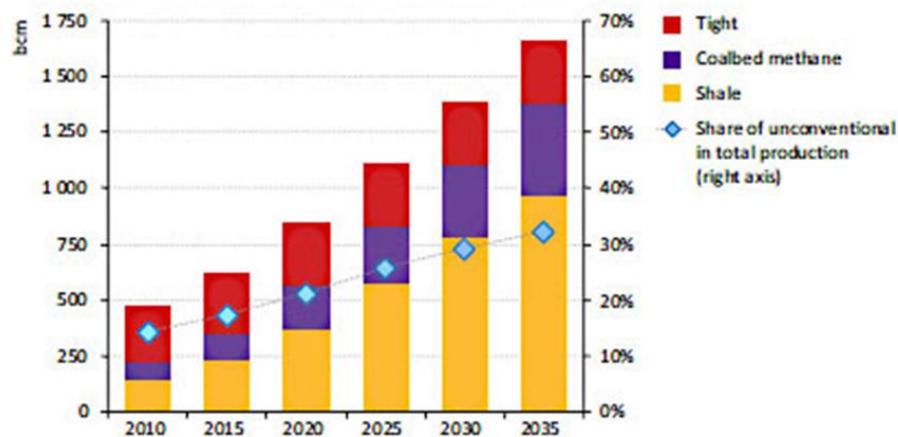
So when you make natural gas cheaper, there’s a net benefit from the one-third of it that squeezes out coal but a net loss from the two-thirds that simply represents higher consumption of natural gas. What’s worse, even in the power generation market there are tradeoffs:

Cheap shale gas will also make electricity cheaper, increasing consumption, which will chip away at the emission reduction from switching from coal to gas... Quantifying all this requires modeling the effect of unconventional gas on energy markets and emissions, which the International Energy Agency (IEA) recently did. Their report predicts that if these gas resources are widely exploited, globally, CO₂ emissions in 2035 will only drop by 1.3%.

...In short, if we assume current policies, shale gas is almost a wash for global CO₂, and methane will decrease or eliminate any small climate benefits of shale gas. If cheap shale gas crowds out renewables or increases energy demand more than IEA predicts, or methane leaks are worse than we think, cheap shale gas will actually hasten climate emissions, even in the short term (2035).

Via email, McCabe tells me that the most important factor in the IEA model is crowding out: Cheap shale gas will reduce coal usage (good) but will also reduce development of new nuclear, wind, and solar power (bad). So this is

Figure 2.4 Unconventional natural gas production by type in the Golden Rules Case



your bad climate news for the day—to go along with shrinking Arctic ice, extreme weather, killer droughts, more wildfires, and monsoons increasingly inundating low-lying areas. Natural gas fracking may be good for North Dakota, but the evidence suggests that, in the end, it won't do much of anything to rein in climate change.

However, let's end on a positive note. McCabe (and the IEA) come to their bleak conclusion only "if we assume current policies." But those policies aren't written on stone tablets. The IEA has a longish set of "Golden Rules" [5] that could make fracking a better environmental bet, and McCabe highlights the two most important of them: (1) Eliminate leaks completely from the natural gas production process, and (2) use carbon sequestration to substantially reduce carbon emissions from gas-fired electrical plants. If we really are going to drill, baby, drill—and all the evidence suggests we are—these two things should become our touchstones for doing it responsibly.

The Facts About Fracking

REVIEW & OUTLOOK (Editorial), 25 June 2011, The Wall Street Journal

The U.S. is in the midst of an energy revolution, and we don't mean solar panels or wind turbines. A new gusher of natural gas from shale has the potential to transform U.S. energy production -- that is, unless politicians, greens and the industry mess it up.

Only a decade ago Texas oil engineers hit upon the idea of combining two established technologies to release natural gas trapped in shale formations. Horizontal drilling -- in which wells turn sideways after a certain depth -- opens up big new production areas. Producers then use a 60-year-old technique called hydraulic fracturing -- in which water, sand and chemicals are injected into the well at high pressure -- to loosen the shale and release gas (and increasingly, oil).

The resulting boom is transforming America's energy landscape. As recently as 2000, shale gas was 1% of America's gas supplies; today it is 25%. Prior to the shale breakthrough, U.S. natural gas reserves were in decline, prices exceeded \$15 per million British thermal units, and investors were building ports to import liquid natural gas. Today, proven reserves are the highest since 1971, prices have fallen close to \$4 and ports are being retrofitted for LNG exports.

The shale boom is also reviving economically suffering parts of the country, while offering a new incentive for manufacturers to stay in the U.S. Pennsylvania's Department of Labor and Industry estimates fracking in the Marcellus shale formation, which stretches from upstate New York through West Virginia, has created 72,000 jobs in the Keystone State between the fourth quarter of 2009 and the first quarter of 2011.

The Bakken formation, along the Montana-North Dakota border, is thought to hold four billion barrels of oil (the biggest proven estimate outside Alaska), and the drilling boom helps explain North Dakota's unemployment rate of 3.2%, the nation's lowest.

All of this growth has inevitably attracted critics, notably environmentalists and their allies. They've launched a media and political assault on hydraulic fracturing, and their claims are raising public anxiety. So it's a useful moment to separate truth from fiction in the main allegations against the shale revolution.

-- Fracking contaminates drinking water. One claim is that fracking creates cracks in rock formations that allow chemicals to leach into sources of fresh water. The problem with this argument is that the average shale formation is thousands of feet underground, while the average drinking well or aquifer is a few hundred feet deep. Separating the two is solid rock. This geological reality explains why EPA administrator Lisa Jackson, a determined enemy of fossil fuels, recently told Congress that there have been no "proven cases where the fracking process itself has affected water."

A second charge, based on a Duke University study, claims that fracking has polluted drinking water with methane gas. Methane is naturally occurring and isn't by itself harmful in drinking water, though it can explode at high concentrations. Duke authors Rob Jackson and Avner Vengosh have written that their research shows "the average methane concentration to be 17 times higher in water wells located within a kilometer of active drilling sites."

They failed to note that researchers sampled a mere 68 wells across Pennsylvania and New York -- where more than 20,000 water wells are drilled annually. They had no baseline data and thus no way of knowing if methane concentrations were high prior to drilling. They also acknowledged that methane was detected in 85% of the wells they tested, regardless of drilling operations, and that they'd found no trace of fracking fluids in any wells.

The Duke study did spotlight a long-known and more legitimate concern: the possibility of leaky well casings at the top of a drilling site, from which methane might migrate to water supplies. As the BP Gulf of Mexico spill attests, proper well construction and maintenance are major issues in any type of drilling, and they ought to be the focus of

industry standards and attention. But the risks are not unique to fracking, which has provided no unusual evidence of contamination.

-- Fracking releases toxic or radioactive chemicals. The reality is that 99.5% of the fluid injected into fracture rock is water and sand. The chemicals range from the benign, such as citric acid (found in soda pop), to benzene. States like Wyoming and Pennsylvania require companies to publicly disclose their chemicals, Texas recently passed a similar law, and other states will follow.

Drillers must dispose of fracking fluids, and environmentalists charge that disposal sites also endanger drinking water, or that drillers deliberately discharge radioactive wastewater into streams. The latter accusation inspired the EPA to require that Pennsylvania test for radioactivity. States already have strict rules designed to keep waste water from groundwater, including liners in waste pits, and drillers are subject to stiff penalties for violations. Pennsylvania's tests showed radioactivity at or below normal levels.

-- Fracking causes cancer. In Dish, Texas, Mayor Calvin Tillman caused a furor this year by announcing that he was quitting to move his sons away from "toxic" gases -- such as cancer-causing benzene -- from the town's 60 gas wells. State health officials investigated and determined that toxin levels in the majority of Dish residents were "similar to those measured in the general U.S. population." Residents with higher levels of benzene in their blood were smokers. (Cigarette smoke contains benzene.)

-- Fracking causes earthquakes. It is possible that the deep underground injection of fracking fluids might cause seismic activity. But the same can be said of geothermal energy exploration, or projects to sequester carbon dioxide underground. Given the ubiquity of fracking without seismic impact, the risks would seem to be remote.

-- Pollution from trucks. Drillers use trucks to haul sand, cement and fluids, and those certainly increase traffic congestion and pollution. We think the trade-off between these effects and economic development are for states and localities to judge, keeping in mind that externalities decrease as drillers become more efficient.

-- Shale exploration is unregulated. Environmentalists claim fracking was "exempted" in 2005 from the federal Safe Water Drinking Act, thanks to industry lobbying. In truth, all U.S. companies must abide by federal water laws, and what the greens are really saying is that fracking should be singled out for special and unprecedented EPA oversight.

Most drilling operations -- including fracking -- have long been regulated by the states. Operators need permits to drill and are subject to inspections and reporting requirements. Many resource-rich states like Texas have detailed fracking rules, while states newer to drilling are developing these regulations.

As a regulatory model, consider Pennsylvania. Recently departed Governor Ed Rendell is a Democrat, and as the shale boom progressed he worked with industry and regulators to develop a flexible regulatory environment that could keep pace with a rapidly growing industry. As questions arose about well casings, for instance, Pennsylvania imposed new casing and performance requirements. The state has also increased fees for processing shale permits, which has allowed it to hire more inspectors and permitting staff.

New York, by contrast, has missed the shale play by imposing a moratorium on fracking. The new state Attorney General, Eric Schneiderman, recently sued the federal government to require an extensive environmental review of the entire Delaware River Basin. Meanwhile, the EPA is elbowing its way into the fracking debate, studying the impact on drinking water, animals and "environmental justice."

Amid this political scrutiny, the industry will have to take great drilling care while better making its public case. In this age of saturation media, a single serious example of water contamination could lead to a political panic that would jeopardize tens of billions of dollars of investment. The industry needs to establish best practices and blow the whistle on drillers that dodge the rules.

The question for the rest of us is whether we are serious about domestic energy production. All forms of energy have risks and environmental costs, not least wind (noise and dead birds and bats) and solar (vast expanses of land). Yet renewables are nowhere close to supplying enough energy, even with large subsidies, to maintain America's standard of living. The shale gas and oil boom is the result of U.S. business innovation and risk-taking. If we let the fear of undocumented pollution kill this boom, we will deserve our fate as a second-class industrial power.

A Tale of Two Shale States

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Politicians wringing their hands over how to create more jobs might study the shale boom along the New York and Pennsylvania border. It's a case study in one state embracing economic opportunity, while the other has let environmental politics trump development.

The Marcellus shale formation -- 65 million acres running through Ohio, West Virginia, western Pennsylvania and southern New York -- offers one of the biggest natural gas opportunities. Former Pennsylvania Governor Ed Rendell, a Democrat, recognized that potential and set up a regulatory framework to encourage and monitor natural gas drilling, a strategy continued by Republican Tom Corbett.

More than 2,000 wells have been drilled in the Keystone State since 2008, and gas production surged to 81 billion cubic feet in 2009 from five billion in 2007. A new Manhattan Institute report by University of Wyoming professor Timothy Considine estimates that a typical Marcellus well generates some \$2.8 million in direct economic benefits from natural gas company purchases; \$1.2 million in indirect benefits from companies engaged along the supply chain; another \$1.5 million from workers spending their wages, or landowners spending their royalty payments; plus \$2 million in federal, state and local taxes. Oh, and 62 jobs.

Statistics from Pennsylvania bear this out. The state Department of Labor and Industry reports that Marcellus drilling has created 72,000 jobs between the fourth quarter of 2009 and the first quarter of 2011. The average wage for jobs in core Marcellus shale industries is about \$73,000, or some \$27,000 more than the average for all industries.

The Pennsylvania Department of Revenue says drillers have paid more than \$1 billion in state taxes since 2006 -- and the numbers are swelling. In 2011's first quarter, 857 oil and gas companies and affiliates paid \$238 million in capital stock and foreign franchise taxes, corporate income taxes, sales taxes and employer withholding. This exceeds by some \$20 million the total payments in 2010.

The revenue department also identified some \$214 million in personal income taxes paid since 2006 that can be attributed to Marcellus shale lease payments to individuals, royalty income and asset sales. And all of this with no evidence of significant environmental harm.

Then there's New York. The state holds as much as 20% of the estimated Marcellus shale reserves, but green activists have raised fears about the drilling technique known as hydraulic fracturing and convinced politicians to enact what is effectively a moratorium.

The Manhattan Institute study shows that a quick end to the moratorium would generate more than \$11.4 billion in economic output from 2011 to 2020, 15,000 to 18,000 new jobs, and \$1.4 billion in new state and local tax revenue. These are conservative estimates based on a limited area of drilling. If drilling were allowed in the New York City watershed -- which Governor Andrew Cuomo is so far rejecting -- as well as in the state's Utica shale formation, the economic gains would be five times larger.

Consider New York's Broome County, which borders Pennsylvania and from which you can spot nearby rigs. The county seat of Binghamton ought to be a hub for shale commerce, but instead its population is falling as its young people leave for jobs elsewhere.

A study commissioned by the county in 2009 found that Broome could support up to 4,000 wells, but drilling even half that number would create some \$400 million in wages, salaries and benefits; \$605 million in property income from rents, royalties and dividends, and some \$43 million in state and local tax revenue.

The Broome analysis pointed to Texas, where Chesapeake Energy paid Dallas Fort Worth International Airport \$180 million for drilling rights on 18,000 acres of airport property -- \$10,000 per acre. The airport receives a 25% royalty on the natural gas produced by airport wells -- more than \$28 million in fiscal 2008. The study also noted the boon that rising oil and gas property values have been to Texas landowners, tax authorities and school districts.

Governor Cuomo has said he wants to lift New York's moratorium, and the state's recently released draft rules are a step forward. But they must still undergo legal review and a public comment period that could bar New York drilling for the rest of this year, if not longer. New York will also still ban drilling in about 15% of the state's portion of the Marcellus and impose more onerous rules than other states on private property drilling. Such bows toward the obsessions of rich, big-city greens explain why parts of upstate New York are the new Appalachia.

As they look across their northern border, Pennsylvanians can be forgiven for thinking of New Yorkers the way Abba Eban once described the Palestinians: They never miss an opportunity to miss an opportunity.
