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Big Money Drives Up the Betting on the Marcellus Shale

By JOEL KIRKLAND of [ClimateWire](#)

WILLIAMSPORT, Pa. -- Halliburton is building a permanent outpost here on the edge of a one of the 21st century's biggest energy booms.

Southeast of here, on an old strawberry patch at a bend in the river, Halliburton's industrial dwelling rests against the lush landscape of hills and valleys. In July, the Texas oil services giant will start mixing cement and storing equipment for natural gas companies drilling in the tough shale rock of northeastern Pennsylvania.

Halliburton is a ubiquitous presence in the world's biggest oil fields. For the past two months, it has defended itself against charges that shoddy cement work contributed to a methane blast that sank BP's rig in the Gulf of Mexico and killed 11 people. As long as the well keeps gushing, public anger could weaken America's appetite for offshore drilling.

But far from the Gulf Coast and outside of the media spotlight, Halliburton and the oil and gas industry are spending billions of dollars in preparation for decades of drilling in the Marcellus Shale. The 95,000-square-mile sheet of natural gas-rich sediment sprawls across Pennsylvania, southern New York, West Virginia and eastern Ohio.

Geologists have long known about gas deposits trapped in the 390-million-year-old formation. But only since 2008, and at a rapidly escalating pace, has the oil and gas industry brought to bear the technological and financial resources to crack it.

"Companies see how close the shale gas is to the Northeast consumer markets," says Alay Patel, an upstream research analyst for Wood Mackenzie. "They see a long-term source where the cost of supply is really low compared to what they see in other areas of the Lower 48."

Drillers blast water, sand and chemicals 8,000 feet into the ground, creating the pressure needed to crack the shale and release the gas. On today's industrial drilling sites, plumes of smog-forming pollutants escape from trucks, generators, condensate tanks and compressor stations.

In northern Appalachia, deep-seated public anxiety has set in about the environmental impact of horizontal gas drilling and hydraulic fracturing, or "fracking." Regulators responsible for protecting the clean water supplies of New York City and Philadelphia have called a drilling timeout in the Delaware River watershed.

But rivers of corporate cash continue to flow into the Marcellus and other shale fields. The magnitude of investment this year alone suggests energy companies have no plans to retreat from an ocean of recoverable

gas.

At the power plant, a natural gas-burning electricity generator produces half the carbon dioxide emissions of a plant that burns coal. Some advocates for slashing emissions tied to global warming say gas is a plausible alternative for utilities saddled with aging coal-fired power plants.

Plans for 30,000 wells in 10 years

The industry expects to drill some 30,000 Marcellus wells by 2020. Placing a thumb on an accurate figure for how much gas can be recovered from the Marcellus remains a matter of geological guesswork. But if companies develop the shale to its full potential, according to some estimates, it rivals Russia's massive gas fields and the untapped reserves off the coast of Iran and in the Caspian Sea.

On June 25, shareholders for Texas gas producer XTO Energy finalized a \$31 billion sale to Exxon Mobil Corp. The deal injects into North America's gas fields the muscle and capital heft of the world's largest integrated energy company. Exxon will become the third-largest gas producer in the prolific Barnett Shale and gain a strong bridgehead in the Marcellus, where XTO controls minerals under 280,000 acres near Williamsport and Pittsburgh.

In early June, Royal Dutch Shell PLC announced that it plans to buy Pittsburgh-based East Resources for \$4.7 billion. That sale yields a significant return for one of the nation's richest private equity firms, Kohlberg Kravis Roberts & Co. Just a year ago, KKR spent about \$320 million for a substantial minority stake in East Resources.

For Exxon and Shell, the bet is that relatively low-cost gas production means a steady revenue stream, as electricity generators in the eastern half of the United States switch from coal to gas to comply with clean air standards and slash carbon dioxide emissions tied to global warming.

More than a dozen companies have amassed leasehold positions in excess of 100,000 acres in Pennsylvania.

Chesapeake Energy Corp. of Oklahoma City boasts the largest Marcellus foothold. It has aggressively built its 1.6-million-acre position since scooping up Appalachian gas producer Columbia Natural Resources LLC for \$2.2 billion in 2005. Following drilling tests that reaffirmed strong hunches about the gas formation's potential, Chesapeake signed a joint venture with Statoil in 2008.

The deal handed the Norwegian oil behemoth 600,000 acres of American shale to explore for a tidy sum of \$3.3 billion, including a \$1.2 billion upfront capital injection to help Chesapeake expand its drilling operation.

Drilling for deals

The Statoil deal paved the way for other joint ventures and buyouts in the shale. Small and mid-sized companies that spent years locking up Marcellus acreage needed the financial resources of bigger partners to develop it. In the past six months, the deal-making has only accelerated.

"The sheer scope and resource potential of the Marcellus is a big draw," says Eric Kuhle, a gas analyst at

Wood Mackenzie. "You can capture the upside with these partnerships."

Energy companies from India and Japan are dumping shareholder wealth into Appalachian gas production. In February, Japan's Mitsui & Co. entered a \$1.4 billion joint venture with Anadarko Petroleum Corp.

Pittsburgh-based Atlas Energy Inc. in April formed a \$1.7 billion partnership with Reliance Industries Ltd., the largest private-sector company in India. The conglomerate is controlled by Indian billionaire Mukesh Ambani, who has been pushing the company to secure lucrative energy investments outside of India.

"In the last few years, we realized we had this extremely valuable asset," says Jeff Kupfer, senior vice president of Atlas. "We needed a lot of capital to develop it." Once Atlas put out a feeler, the Marcellus prospect attracted attention from the world's major oil and gas companies. "There was something in the chemistry with Atlas and Reliance."

Reliance agreed to pay \$340 million in upfront cash and to contribute \$1.3 billion to develop the Marcellus. In return, Reliance gets a 40 percent share of the venture and can send engineers and field workers to learn about the fracking technology. "They're looking at it as a way to gain exposure and expertise," Kupfer says.

Shale gas underlies North America, Europe and possibly China. In a statement to shareholders a few weeks ago, the Reliance chairman made his take on the gas boom plain. "It is likely to overtake both conventional gas as well as liquid fuels as a source of energy within the next decade," Ambani told investors.

A few days later, on June 23, Reliance agreed to buy a 45 percent stake in Pioneer Natural Resources Co.'s acreage in the Eagle Ford shale field in south Texas for \$1.15 billion.

Companies that tested fracking technology in Texas and Oklahoma in the 1990s have spent the past five years locking up access to millions of acres in those states and across Appalachia, Louisiana, Arkansas, Great Plains states and western Canada. In 25 years, according to IHS Cambridge Energy Research Associates and Wood Mackenzie, shale and tight-sand formations will account for more than half of U.S. gas production. The supply potential has expanded by as much as 50 percent.

A shift that surprised the government

It has been a surprising shift. In 2005, both the gas industry and the U.S. government, including Congress and the Federal Energy Regulatory Commission, had settled on the idea that the United States would import liquefied natural gas from the Middle East, Russia and Africa. As the American economy expanded, imported LNG would make up for declining gas supplies from the Gulf of Mexico and Canada.

Today, the industry boldly promises the shale gas will fill the gap and create a long-term surplus of gas.

The Marcellus is among the five "big shales" identified as the best bets for production. The Barnett in east Texas, Haynesville in Louisiana, Fayetteville in Arkansas, and Woodford in Oklahoma top those shales. Barclays Capital anticipates that once investments targeting Marcellus gas reach full bloom, it could rapidly surpass production out of Arkansas and Oklahoma by the end of 2012 and compete with the mighty Barnett for kingmaker in onshore gas development by 2020.

The low cost of producing Marcellus gas, its pipeline-ready quality and its proximity to consumers in the

Northeast have driven investment. With total production costs around \$3.50 to \$4 per million British thermal units, according to Barclays Capital, gas companies can make money even if future gas prices languish some.

But if gas prices crater, the boom ends.

Meanwhile, though, it is jobs, jobs and more jobs in Pennsylvania that matter the most.

If gas prices stay in the sweet spot to spur supply and demand, then job creation could be huge, depending on the state's ability to train workers, says Larry Michael, who heads a training program at Pennsylvania College of Technology in Williamsport.

"The optimistic charts are not optimistic enough," Michael says.

The gas rush in southwestern Pennsylvania has claimed a significant slice of Pittsburgh's economy. One in five business expansions is tied to the nearby shale deposits, according to the Pittsburgh Regional Alliance.

From flatboat merchants to steel, oil and coal, Pittsburgh is the embodiment of U.S. industrial grit and natural resource potential. But the slow-moving dilution of the American manufacturing core since the collapse of Steel City has given way to a fresh crop of entrepreneurs and financiers: The gas barons have pushed their way into Pittsburgh's new economy.

The new barons of Pittsburgh

Consol Energy Inc., the coal giant and one of Pittsburgh's corporate icons, said in March that it would pay \$3.4 billion for a chunk of Marcellus acreage in its buyout of Richmond, Va.-based Dominion Resources Inc. And in August, former Beatle Paul McCartney will open Consol Energy Center, the future home of the Pittsburgh Penguins.

Back in Williamsport, Jason Fink, vice president of the Williamsport-Lycoming Chamber of Commerce, is the point man for employers. As he drove his SUV from site to site in May, he took a phone call: Does Schlumberger have all the information it needs? Weatherford, a Swiss-based competitor, is setting up shop nearby.

Square-jawed and young, an early-morning bike rider, Fink has spent the past year connecting gas field companies to offices, warehouses and real estate. "It's our proximity to the northeast part of this play," he tells companies, "and the distance between us and Pittsburgh." He also wants to lure back a manufacturing base that dried up in the 1990s. "How we'll position it is this," he explains. "If you use natural gas, be close to where it's at."

Fink stops at the 24-acre Halliburton site, where the first building could be operational in July. On a walk around the site with a *ClimateWire* reporter, the construction manager who moved east from Texas says his contract for the Marcellus job is for three years. After that, he says, he might stick around.

Perhaps the greatest challenge, Fink acknowledges, is preparing locals to work in the gas industry.

Pennsylvania is the birthplace of U.S. oil drilling, and Fink's father worked for Sun Oil. "These are

good-paying jobs, but you got to work it through. It's a long day," he says.

In the Rust Belt, a hard day's work is only a memory to some. "But the gas industry is rooted in 12-hour and 14-hour days for weeks on end," he says. A job fair in May attracted hundreds of men who needed work. Once the companies explained how their industry operates, some stayed to hear more, and some left.

Almost 600,000 people are unemployed in Pennsylvania, and the state struggles to find the economic growth to cover a \$1.2 billion budget shortfall. Questions about job growth tied to Marcellus development are at the heart of discussions about recharging the economy.

An industry-sponsored report out of Pennsylvania State University served as ammunition for the gas industry's argument that there will be a lot of jobs and they're here to stay. The report claims that 88,000 jobs directly and loosely tied to the Marcellus -- from drillers to hotel employees -- will have been created in the state by the end of this year, and more than 200,000 jobs will be created by 2020. It estimates about \$8 billion in indirect economic stimulus in 2010.

More and more wells are drilled each year in the Marcellus. This year, according to the report, producers expect to drill nearly 1,750 wells, double the number of wells drilled last year. By 2020, gas producers will have drilled roughly 30,000 wells in the four-state gas formation, double the number of wells drilled today in the earliest and most productive shale gas field, the Barnett that surrounds Fort Worth, Texas.

If the drilling rate ramps up at this rate, the Marcellus will produce 13 billion cubic feet a day of gas by 2020, a twenty-sevenfold increase.

Will the prices and the jobs remain high?

But the report rolled out in May has faced withering attacks, primarily because it was paid for by the influential gas drillers' alliance, the Marcellus Shale Coalition, and touted by the Washington-based gas coalition Energy in Depth. The critics contend that the industry tally of the jobs and economic benefits is wildly optimistic and ignores the environmental and social costs. They point out that U.S. Labor Department and state tallies of jobs directly tied to the gas industry are far lower.

Questions remain, says Michael Wood, research director of the Pennsylvania Budget and Policy Center. They include the speed by which the gas industry will replace workers imported from Texas, Oklahoma and Calgary, Alberta, with homegrown laborers and technicians.

The Penn State economic study assumes Marcellus development continues unabated. But that only happens if gas prices remain high enough to support drilling costs. And demand will only grow if gas prices remain competitive with low-cost coal used for power generation.

"When it's gone, the state is left holding the tab, cleaning up the environmental damage," Wood says. If anything, he says, the BP PLC oil spill in the Gulf of Mexico underscores that a costly environmental catastrophe isn't out of the question.

"Even with the best protections, things happen."

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Former Colo. senator calls for 'aggressive' lobbying campaign

U.N. Foundation President Tim Wirth is expected to urge natural gas producers today to lobby more aggressively for U.S. public policies that encourage electric utilities to retire old coal-fired power plants and burn cleaner natural gas.

"The coal industry has been fiercely effective with Congress and regulatory authorities in defending its turf, and you have to be as well," Wirth says in remarks prepared for a Colorado Oil and Gas Association meeting in Denver.

The former Democratic senator from Colorado doesn't mince words, admonishing the broader gas industry for failing to make a public policy case for gas.

"So far your industry has mostly run nice, positive, feel-good advertising, rather than conducting the persistent, aggressive campaign that will be needed for this transition," he says. "Fortunately, you have some new ammunition: The shale deposits in coal states like Illinois, Indiana, West Virginia, Ohio and Pennsylvania can change both the economies and the politics of those key states -- and therefore of Washington."

Tension in the energy sector about the extent to which state and federal policies should incentivize utilities to retire coal plants and instead use gas is palpable on a national level. Gas burns cleaner than coal, emitting half the amount of greenhouse gases as well as far less ozone and haze-causing nitrogen oxide.

Yet on the national stage, coal has kept a hold on the politics of energy and climate change. Coal interests have opposed climate bills that would increase the cost of using coal. And lawmakers from states that produce or consume a lot of coal have sought federal funding to incentivize "clean coal" projects that develop carbon capture and storage for coal-fired power generators.

If the state of play in the climate debate has as much to do with job creation and the cost of cutting emissions, Wirth says, why not make that part of the argument?

"After all, it's not that the voters love coal," he says, "it's that they love the jobs and the economic benefits that come with it. And natural gas can do better."

Gas industry still using old tactics

Wirth's U.N. Foundation, the philanthropic arm of the United Nations, works closely with a Washington-based group called the Energy Future Coalition. C. Boyden Gray, a White House counsel in the George H.W. Bush administration, and John Podesta, White House chief of staff under President Clinton, both sit on the group's steering committee, which also includes other major players in the development of U.S. energy and environmental policies.

Wirth told ClimateWire yesterday that the Energy Future Coalition is calling on the gas industry and its cohorts in the electric utility industry to reject adversarial tactics that pit natural gas production against environmental regulations, or that pit gas against wind power.

"They have this new fuel and opportunity, but they're unfortunately largely stuck in the old way of doing

business," Wirth said.

Wirth compared today's fight over disclosing chemicals used with unconventional gas drilling with food labeling debates that ended decades ago. The decision by the gas lobby to battle disclosure of chemicals injected into the ground during the hydraulic fracturing process needlessly alienates the public.

"If gas companies don't disclose, they'll get into a fight with the public that will ultimately revolve around their right to operate," he said in the interview.

In Denver, Wirth and the coalition will urge gas producers to throw their weight behind natural gas use in heavy-duty trucks, a plan famously sought by the Texas oil magnate T. Boone Pickens; alternative fuel use, including natural gas, in urban vehicle fleets; and a large-scale transition from old coal-fired plants to gas plants for electricity generation.

For 20 years, the coal industry has lobbied to keep aging power plants open. Gas prices are low, Wirth said, so it's time to start talking about signing long-term supply contracts with utilities. Combined-cycle gas plants run at only about 40 percent of their full capacity, and there is greater spare gas capacity in the Southeast.

Emerging debate over fuel-switching

Coal-fired generation accounts for about 45 percent of U.S. electricity use. Some utilities, including Colorado's largest utility, Xcel Energy Inc., have started a slow-moving shift away from cheap coal to a combination of natural gas, wind and solar power and demand-side efficiency.

Colorado lawmakers and Gov. Bill Ritter (D) worked closely with Xcel earlier this year to craft legislation that enabled a relatively smooth transition away from coal-fired generation.

"It's a great model for the rest of the country," Wirth said. "And the industry ought to be working to make it a usable model."

Fuel-switching to gas is emerging in large part because of tougher U.S. EPA restrictions on air pollutants, state environmental mandates, cautious optimism that natural gas prices will remain competitive with coal, and a sense that Congress at some point plans to mandate cuts in greenhouse gas emissions.

Colorado is a major gas producer out of its Piceance Basin fields west along I-70 between Glenwood Springs and Grand Junction. To get at the tight gas deposits, some of the drilling requires the hydraulic fracturing used in the nation's major shale basins.

Wirth's comments come at an inflection point in the energy debate. Congress and the White House are deciding whether to pursue a climate bill that would put a price tag on carbon dioxide emissions that contribute to global warming. According to a recent Massachusetts Institute of Technology report and other energy policy researchers, a policy that increases the cost of burning coal would directly affect gas.

Gas could go from supplying about 20 percent of U.S. power generation to 40 percent or more by 2040, according to MIT. Nearly all of that would come at the expense of coal.

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