

Britain Confronts Gas Mother Lode With Fracking Pushed by Browne
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By Edward Robinson

Apr. 3 (Bloomberg) -- An icy rain is pelting about 30 protesters who've converged at the gate of a natural gas drilling site near Manchester, England. On the other side of a fence topped with razor wire, a 10-story-high rig is boring into shale to determine if it's suitable for hydraulic fracturing, or fracking. The demonstrators unfurl a banner: "Fracking will poison our children."

As a phalanx of police officers pushes the protesters back, a convoy of supply trucks inches out of the gate and past an encampment of tents and trailers sporting placards decrying the drilling practice, Bloomberg Markets magazine will report in its May issue. "Fracking will not lower gas prices, Lord Browne,"

one reads on this January morning.

The following week, the man the protesters call "the fracking czar" is seated in a solarium-like conference room overlooking the rooftops of Mayfair in central London. John Browne, a former chief executive officer of oil giant BP Plc, is clad in a crisp, white dress shirt, enameled cuff links, a royal-blue necktie and dark trousers.

Browne, an independent member of the House of Lords and a nonexecutive director in the U.K. government's Cabinet Office, is lamenting how the protests may slow his efforts to bring America's shale boom to Britain.

Browne says fracking would secure a new domestic energy source, create thousands of jobs, generate billions of pounds in tax revenue and be a far cheaper alternative than constructing nuclear plants.

Revolutionizing Energy

"Shale gas could be very, very important for this country; it could be transformative," says Browne, 66, who's now chairman of Cuadrilla Resources Ltd., a British exploration firm that plans to frack the English countryside. "It's like the opening of Alaska or western Siberia or the Gulf of Mexico."

Browne, who was trained as a petroleum engineer, played a part in each of those pivotal events during 38 years at BP, including 12 as CEO. Now, seven years after leaving BP, he's at the forefront of a push by major energy companies and wildcatters to take fracking global.

Hydraulic fracturing -- in which drillers blast water, sand and chemicals into shale deep beneath the earth to release oil and natural gas -- is revolutionizing the energy game in the world's No. 1 economy: After steadily declining for about 25 years, U.S. oil production surged 47 percent from 2008 to 2013, according to data compiled by Bloomberg. The Department of Energy forecasts that the U.S., which imported 6 percent of the gas it used in 2012, will be a net exporter of the hydrocarbon by 2018.

Shale Boom

Even as evidence mounts that fracking operations drain aquifers and spew methane into the air, energy firms are fanning out across mammoth shale deposits in China, Russia, India, South Africa, Australia, Argentina and elsewhere.

Royal Dutch Shell Plc, based in The Hague, has joined forces with Beijing-based China Petroleum & Chemical Corp., or Sinopec, in central and southern China to exploit the world's largest shale gas-laden formations.

And San Ramon, California-based Chevron Corp. has agreed to invest as much as \$16 billion in partnership with YPF SA, Argentina's state oil producer, to drill in the Vaca Muerta formation near the Andes. That deposit alone could multiply the South American nation's oil reserves eightfold and make it a power in natural gas exports, according to the U.S. Energy Information Administration, or EIA.

Mother Lode

U.S. wildcatters, who started the shale boom in the mid-2000s, are ready to pounce now that Mexican President Enrique Pena Nieto has opened his country to foreign petroleum investment. One choice target: the gas-rich Eagle Ford formation that snakes from Texas into the Mexican state of Tamaulipas.

"It's the best shale play in Texas, but when you hit Mexico, there's no activity," says Chris Wright, CEO of Liberty Resources II LLC, a Denver-based producer that fracks oil in North Dakota.

Even relatively small Britain is sitting on a gas mother lode. The Bowland-Hodder formation, a belt of shale that stretches across England's midsection, holds more than 37 trillion cubic meters (1,300 trillion cubic feet) of natural gas, according to estimates from the British Geological Survey.

That's almost the same size as the Marcellus deposit under the Appalachian Mountains, the No. 1 shale gas find in the U.S. The mineral is so impermeable that it yields only a fraction of its hydrocarbons to producers.

Welcome Windfall

The Marcellus is on course to give up about 9 percent, according to data from the Marcellus Center for Outreach and Research at Pennsylvania State University in University Park. If the Bowland performs similarly, Britain will have enough gas to meet its needs for more than 40 years, according to data from the BGS and the EIA.

Such a windfall would be welcome in a country that expects to import 70 percent of its natural gas by 2020 as its North Sea reserves dwindle, says Michael Fallon, the U.K. energy minister.

"Shale gas is coming to the U.K. one way or another," says Fallon, Prime Minister David Cameron's point man on shale gas development. "It would be far nicer if it came from underneath Britain rather than be imported from the U.S. or elsewhere."

Later this year, the U.K. government plans to issue a new round of oil and gas exploration licenses for an area covering about 60 percent of England, Scotland and Wales.

Renewable Resources

The shale boom is striking as the world's leading economies struggle to find a balance between promoting economic growth and addressing climate change. The U.S., the European Union and China, among others, have vowed to reduce greenhouse gas emissions over the next two decades by relying more on wind, sunlight and other renewable resources.

In the midst of a brutal winter that left record snowfall and flooding in the Northern Hemisphere, the European Commission in January proposed reducing carbon dioxide emissions to 40 percent below 1990 levels by 2030.

Yet soaring demand for energy worldwide will require an investment of about \$37 trillion over the next 21 years on new infrastructure for electricity and fuel production, according to the Paris-based International Energy Agency. Forecasting that renewable sources would account for just 18 percent of energy usage by 2035, compared with 13 percent in 2011, it suggested the world may be entering a "Golden Age of Gas."

"We are definitely going to have to burn hydrocarbons for a considerable amount of time; we have no choice," says Browne, who became the first CEO of an oil major to acknowledge that fossil fuels contributed to climate change, in a 1997 speech he gave at Stanford University.

Russia Angle

Even the green-leaning EU may find shale irresistible, says Fadel Gheit, an oil industry analyst at Oppenheimer & Co. in New York. Natural gas, which is composed primarily of methane, emits half the carbon dioxide of coal when burned in power plants, according to the U.S. Environmental Protection Agency.

It could offer the 28-nation bloc relief from steep energy prices. European manufacturers pay more than twice what they would in the U.S. for electricity, the European Commission says.

Then there's the Russia angle. The EU imports about 30 percent of its natural gas from its neighbor to the east, with several pipelines traversing strife-torn Ukraine on Russia's southwest flank. On March 3, natural gas futures in Germany, the U.K. and other European markets spiked as much as 10 percent as Russian troops took control of Ukraine's Crimea region.

'Hard Choices'

Europe's vulnerability contrasts with the energy security that the U.S. has derived from its shale bonanza. Following approval from the Obama administration, American producers will begin exporting natural gas in 2015.

Meanwhile, U.S. Senator Lisa Murkowski, an Alaska Republican, is leading an effort for suspension of the 39-year-old ban on oil exports. The State Department's Bureau of Energy Resources, formed in 2011, plans to use American hydrocarbons as a new tool of foreign policy.

Browne says the upheaval in Ukraine should spur European political leaders to clear the way for shale gas.

"I hope this reminds people that having indigenous sources is a good thing," he says.

Germany, Spain and the Scandinavian nations have approved shale exploration, and Cuadrilla has leased sites in the Netherlands.

"John Browne is on the right track," Gheit says.

"Fracking has transformed our thinking in the U.S. about our energy future. And Europe will have to finally wake up and realize that it needs to make some hard choices about developing its own domestic resources."

Carbon Dioxide

Renewable energy advocates counter that shale gas may deepen dependence on hydrocarbons and worsen global warming. The impact of methane, in its unburned form, on climate change is 20 times that of carbon dioxide, according to the EPA.

In August, a study conducted by scientists from the U.S. National Oceanic and Atmospheric Administration found that natural gas wells in Utah were releasing 6 to 12 percent of their output into the air.

Such leakage could erase the advantage natural gas has over coal, says Nicholas Stern, chairman of the Grantham Research Institute on Climate Change and the Environment at the London School of Economics and Political Science. He says he's concerned policy makers will embrace shale at the expense of alternatives such as wind and solar power.

Wind Farms

"It is important that policies to encourage the development of shale gas do not create uncertainty and undermine the confidence of investors about the future for low-carbon energy sources in the U.K.," Stern said in an e-mailed response to questions. "It would not be helpful, for instance, if the promotion of shale gas by the government slowed down the deployment of wind farms."

U.K. Energy Minister Fallon says the government remains committed to renewable energy, citing the 66 million pounds (\$110 million) in investments it's making to spur the development of offshore wind farms and other projects.

Even if natural gas supplants coal in the U.K. or throughout the EU, the dirtier fossil fuel will still be burned elsewhere, says Matthew Spencer, the director of Green Alliance, a London-based environmental group.

U.S. coal exports to Brazil, Germany and other markets have doubled since fracking took off in 2005, as American utilities have opted for cheap natural gas, according to the DOE. Spencer says the influx of shale gas may have the perverse effect of forcing coal producers to lower prices to compete.

'Cleaner Fuel'

That, in turn, will make coal more attractive to burn, increasing carbon dioxide emissions, the No. 1 cause of atmospheric warming, according to the EPA.

“Even though gas is a cleaner fuel, the growth of shale runs a locomotive through our attempts to limit climate change,” Spencer says. “If shale gas development isn’t accompanied by a constraint of coal, then it’s going to be a disaster.”

Browne’s shale play vaults him into the center of yet another historic shift in the global energy industry. Only this time he’s not running a company with 97,000 employees that produced almost 4 million barrels of oil equivalent a day in more than 100 countries.

Today, Browne, an elegant man with wavy brown hair and amused eyes, is a partner at Riverstone Holdings LLC, a New York–based private-equity firm with \$27 billion invested in energy companies ranging from biofuel makers to pipeline operators.

Exploratory Wells

In 2010, a Riverstone fund acquired a 41 percent stake in Cuadrilla for \$58 million, and Browne joined its board. Based in Lichfield, England, the seven-year-old company is named after the team of helpers who aid the matador in a bullfight.

Cuadrilla’s primary asset: the government-issued shale gas exploration license for a huge chunk of the Bowland deposit in Lancashire, a county in northwestern England. In February, the company said it planned to apply to the local county council for permits to frack eight exploratory wells there, the biggest such operation to date in the U.K.

The geology looks so promising that in June, Centrica Plc, a publicly traded energy company based in Windsor, England, bought a 25 percent interest in Cuadrilla’s Bowland license for 40 million pounds and agreed to pay up to 120 million pounds in exploration costs. Cuadrilla paid 1,000 pounds for the license.

Boyhood Memories

Browne has become the face of fracking in the U.K.—so much so that the protesters at the drilling site near Manchester singled him out even though another company, IGas Energy Plc, not Cuadrilla, is the operator there. Browne has been steeped in the petroleum trade since he spent part of his childhood amid Iran’s oil fields.

His father, John, worked for BP, and his mother, Paula, a Hungarian of Jewish descent who was imprisoned in Auschwitz, was a hatmaker. Browne says one of his most vivid boyhood memories is of a well fire that burned for more than a month.

After earning a degree in physics from the University of Cambridge in 1969, Browne joined British Petroleum as a field engineer and was dispatched that November to the oil rush then dawning on Alaska’s forbidding North Slope. During the next 25 years, Browne managed some of BP’s most-valued exploration and production projects, including the now-legendary Forties field in the North Sea and deep-water exploration in the Gulf of Mexico.

Biggest Deal

Browne kicked off the era of the oil supermajor after he became CEO in 1995. In 1998, he executed the \$62 billion takeover of Amoco Corp., the biggest oil deal of its kind up to then. The next year, Exxon Corp. acquired Mobil Corp. for \$88 billion. Big Oil was in full swing.

Browne broke from industry orthodoxy in 2000 by pledging to address global warming with investments in renewable energy projects. He shortened the company's official name to BP, adopted the slogan "beyond petroleum" and replaced the company's shield logo with a sunburst in green, yellow and white.

Finding oil remained paramount, and in the early 2000s, Browne -- abetted by his friend Tony Blair, then-U.K. prime minister -- negotiated one-on-one with Russian President Vladimir Putin to open Siberia in a big way to Western petroleum companies.

That led to the formation in 2003 of TNK-BP, a joint venture that has since unwound and left the British company with a 20 percent stake in OAO Rosneft, Russia's No. 1 oil concern.

British Establishment

By 2006, Browne had become one of the most influential oilmen of his era and a member of the British establishment. He was ennobled by Elizabeth II in 2001, when Blair was in office, as Lord Browne of Madingley, after a village near Cambridge where he lived.

He served as president of the Royal Academy of Engineering, became a director of Goldman Sachs Group Inc. and was a regular at the annual World Economic Forum in Davos, Switzerland. His green credentials got him heralded as "the Sun King" in a 2002 Financial Times profile.

Then a spate of disasters battered Browne's fortunes -- and those of BP, which began to lose its green luster. In 2005, an explosion killed 15 BP workers at a refinery near Houston that had inadequate safety practices, according to a commission led by former U.S. Secretary of State James Baker.

'The Glass Closet'

The next year, a BP pipeline in Alaska dumped more than 212,000 gallons of crude onto the tundra. Those events foreshadowed others that occurred after Browne left BP, including the worst oil spill in history, the 2010 Deepwater Horizon rig blowout in the Gulf of Mexico.

In January 2007, Browne, a gay man who'd kept his sexual orientation a secret, faced a personal crisis. A former boyfriend gave an account of his relationship with the BP CEO to the Mail on Sunday newspaper.

Seeking an injunction to block its publication, Browne misled the court, saying in a witness statement that they'd met while jogging in a park rather than through an escort agency. He resigned as CEO on May 1, 2007.

Browne has now become an advocate for addressing homophobia in the corporate world. He's written a book, "The Glass Closet," to be published in May by WH Allen, that tells his own story and those of other men and women who've struggled with whether to come out in their professional lives.

“I wrote it because I never want anyone to go through what I went through,” he says.

‘Keep Fracking’

In his new business incarnation, Browne will seek to overcome the opposition of many Britons who find unconscionable his plans for their densely populated island kingdom, which is only slightly larger than Minnesota.

Because gas output from shale typically falls 70 percent after the first 12 months of operation, Cuadrilla and other operators would have to drill 2,000 to 3,000 new wells a year to match the annual volume of imported natural gas, says David King, a former U.K. government chief scientific adviser who’s now the Foreign Office’s special representative for climate change.

“If you want to keep up production, you have to keep up fracking,” King told the House of Lords Economic Affairs Committee in January.

Dozens of community groups have joined forces with environmental organizations to appeal to local county councils not to approve fracking applications. In one stratagem organized by Greenpeace, homeowners are asking the courts to block Cuadrilla and other operators from drilling horizontally under their land, a key maneuver in fracking.

‘Amazingly Political’

Unlike in the U.S., British property owners don’t hold title to the oil and gas under their land -- the Crown does. So drillers such as Cuadrilla can’t win grass-roots support by paying out royalties in exchange for drilling rights, which is a crucial instrument U.S. operators have used to lock up sites.

At the Manchester-area site operated by IGas, a London firm that’s one-fifth owned by Hong Kong-based explorer Cnooc Ltd., demonstrators have been blocking an access road and trying to slow delivery vehicles since December.

“It’s going to be amazingly political,” says Garry White, a spokesman for Charles Stanley & Co., a London investment firm that held 515,681 shares in IGas as of March 10. “As projects get delayed, operators will have to raise capital, so as a shareholder you have to ask whether you’ll get diluted out.”

As of that date, IGas shares had returned 26 percent in 12 months.

‘Land Grab’

Browne says he’d rather face public opprobrium, legal challenges and environmental regulations in Britain than the political uncertainty that prevails in other countries.

“This is the next place to go to,” Browne says. “It’s easier than us going to China, where there was a land-grab free-for-all with lots of Chinese companies, or Argentina, or India, or South Africa. There are rules in Europe, and they are slavishly applied. And we are quite sure we can operate within those rules.”

Browne’s shale bet will be decided in a bucket-shaped piece of land called the Fylde that juts into the Irish Sea north of Liverpool. Framed by the gritty

seaside city of Blackpool to the west and the moors of the Bowland Fells to the east, this coastal plain is quilted with rich pastureland, rural villages and some industry. Defense contractor BAE Systems Plc assembles jet fighters here.

The Fylde sits on a part of the Bowland shale that's 1,800 meters (6,000 feet) thick. Cuadrilla has been testing the rock here since 2007.

"We have no doubt there's a lot of gas here," says Andrew Quarles van Ufford, Cuadrilla's technical director.

Alarmed Residents

In 2010, Cuadrilla's operations in the Fylde got off to a shaky start -- literally -- when its drilling triggered two tremors registering 2.3 and 1.5 on the Richter scale. The events alarmed local residents, and the national government declared a moratorium to evaluate seismic risk, which has since been lifted.

If the company eventually moves to full-scale production, the Fylde will become a less tranquil place, according to a strategic environmental assessment released by the U.K.

Department of Energy and Climate Change in December. Tanker trucks hauling water and equipment will make dozens of trips every day to the well sites, which will teem with rigs and chemical storage tanks.

Up to 18,750 cubic meters of water pumped into each well to frack the shale will come back to the surface as mud and wastewater, enough to fill about eight Olympic-sized swimming pools for each well.

Cold Comfort

The assessment concludes that fracking may harm air quality, contaminate groundwater and despoil the landscape. It says regulators and local officials can prevent these adverse effects by making sure the wells are properly constructed and that wastewater is safely removed from drilling sites.

That's cold comfort for Andrew Pemberton, a dairy farmer located about 1 1/2 kilometers south of one of the proposed fracking sites. On a wet February afternoon, Pemberton, wearing blue coveralls and waterproof Wellington boots, is churning up grass and beets for his 130 milk cows in a whirring machine that looks like a giant kitchen mixer.

He says he's anxious because a network of dykes and brooks drains his land southward: If a well ruptured or wastewater spilled upstream from his farm, it could contaminate his pastures.

'Radioactive Grass'

What's more, the U.K. Environment Agency found in 2011 that the flowback water from Cuadrilla's fracked well contained high levels of radium, a naturally occurring radioactive byproduct of uranium that can cause cancer.

"I'm not a bloody tree-hugger, but if I have to raise cows on radioactive grass, who's going to buy my milk?" Pemberton, 57, says. "I'm out of business."

Browne says fracking and farming can coexist because the shale lies thousands of meters below the water table. By making sure the wells remain intact, there will be little danger that wastewater will leak near the surface, he says.

To minimize the surface area of land affected by drill sites, Cuadrilla plans to bore two to four lateral underground shafts from each vertical well.

“We’ll have to be very thoughtful here about how much land we use on top of the shale; this is not Texas,” Browne says.

“Public pressure is an amazing innovator of technology.”

Even so, government and industry are using old-fashioned largess to win fracking support.

Soccer Teams

In January, Prime Minister Cameron announced that county councils would be entitled to keep 100 percent of the taxes drillers pay—twice what municipal bodies normally collect. The U.K. Onshore Operators Group, the industry lobby, pledged to pay

100,000 pounds per well to boroughs and villages.

In Lancashire, Cuadrilla has sponsored soccer teams, a theater group and a young-engineers contest for students with a prize of 10,000 for the winning high school.

Ian Roberts, co-founder of Residents Action on Fylde Fracking, decries these gestures as “bribes.” His organization is urging the Lancashire County Council to reject Cuadrilla’s fracking applications in coming months.

“Cuadrilla is not doing this in the national interest; it’s self-interest,” says Roberts, a retired human resources manager at HM Revenue & Customs, the British tax collection agency.

“We still have the power to stop it,” adds Tina Rothery, another leader of the group.

Viewed from abroad, this sort of local opposition is off-putting for energy companies. Liberty Resources’ Wright says it presents an obstacle to development.

‘Slow, Cumbersome’

“I looked at the Bowland four years ago, but the process in England has been very slow and cumbersome, and that’s because the locals aren’t on board yet,” Wright says.

As Browne sizes up the challenge before him, he reflects on how a technique promoted by a Texas wildcatter named George Mitchell in the early 1990s is changing the world’s biggest industry. Shale, a mineral composed primarily of quartz and clay that happens to be a superb container for oil and gas molecules, is everywhere.

And as nations around the globe grasp the potential for greater energy independence, there’s little chance they’ll leave their shale untouched.

For Browne, the engineer son of an oilman, exploration has always been about measuring the probabilities: You focus on a promising piece of ground, analyze the rock and drill test wells. Browne says fracking is inevitable.

“When you look at the balance of risk and reward, it’s evident that this is something that’s going to be done,” he says.

And whether his compatriots like it or not, Browne’s test well is Britain.

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