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Gas Production at Record as Shale Puzzle Solved: Energy Markets  
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By Christine Buurma

June 15 (Bloomberg) -- U.S. natural-gas producers are pumping fuel at a record pace as advances in drilling techniques help offset a decline in rigs, signaling no respite for the world's worst-performing commodity in the past year.

Gas has tumbled 38 percent since the end of 2007 as companies increased output by about 11 percent to a monthly record in March. Improvements in drilling amid rising demand for the cleaner-burning fuel have outweighed a 45 percent drop in the number of rigs since reaching an all-time high in 2008.

Companies from Range Resources Corp. to Chesapeake Energy Corp. are using capital from joint-venture partners to simplify the process of extracting gas contained in shale, according to Cameron Horwitz, an analyst at Canaccord Genuity in Houston. Natural gas is the only raw material that hasn't gained in the past 12 months, losing 12 percent, according to the Standard & Poor's GSCI Index. Oil has jumped 28 percent in the same period.

"Shale drilling is a huge puzzle, but more and more pieces are falling into place for these producers," Horwitz said. "The typical thought process of 'Well, gas rigs are going down and all of a sudden production will go way down,' may not apply."

Natural gas for July delivery fell 6.5 cents, or 1.4 percent, to settle at \$4.581 per million British thermal units yesterday on the New York Mercantile Exchange, paring a gain of 7.9 percent over the past month. It was at \$4.554 at 10:33 a.m. in London today.

#### 'Unsustainable Rally'

Gas may cost an average \$4.42 per million Btu in 2011, according to the median of 12 analyst estimates compiled by Bloomberg since early March. A 12 percent rally over the past three weeks amid hotter-than-normal weather and maintenance shutdowns of nuclear power plants is "unsustainable," according to Goldman Sachs Group.

"These factors are transient in nature, and their support to generation demand for natural gas will likely diminish in the coming weeks as the weather normalizes and nuclear power plants come out of maintenance," London-based Goldman analysts Samantha Dart and Johan Spetz said in a note to clients June 13. Goldman recommends selling October 2011 Nymex gas contracts.

Improved drilling methods and increased gas-rich acreage have allowed Range to boost output 54 percent since 2007 while cutting wells by 43 percent, the company said in a June investor presentation. Lease operating costs, which include labor, water hauling, power and maintenance, may fall 34 percent this year from 2008, it said.

Range, based in Fort Worth, Texas, has the second-highest number of permits to drill in Pennsylvania's Marcellus Shale, a rock formation that stretches from West Virginia to New York. Oklahoma City-based Chesapeake has the most permits in Pennsylvania.

#### Rig Count

The number of rigs drilling for gas has tumbled from a peak of 1,606 on Aug. 29, 2008, as the recession cut demand for the factory and power-plant fuel, data from Baker Hughes Inc. in Houston show. Gas rigs totaled 879 in the week ended June 10.

U.S. gas production rose 3.3 percent in March to 77.83 billion cubic feet a day, or 2.41 trillion for the month, a record in Energy Department data going back to 1980. The figure represents gross withdrawals, which include gas that's vented, flared or removed in processing, according to the department's monthly report known as EIA-914.

#### Joint Ventures

Joint ventures are giving producers capital to keep drilling as prices slide, said Gordon Pickering, a director at Navigant Consulting Inc. in Sacramento, California.

CNOOC Ltd., China's biggest offshore oil producer, agreed Oct. 10 to pay \$1.08 billion for a one-third interest in Chesapeake's holdings in the Eagle Ford shale formation in Texas. Anadarko Petroleum Corp. of the Woodlands, Texas, agreed on Feb. 16, 2010, to sell a 32.5 percent stake in its Marcellus shale assets to Tokyo-based Mitsui & Co. for \$1.4 billion.

"There's quite a bit of money in the market to support the gas business," Pickering said. "We're seeing especially that some of the independent producers have been particularly active in joint ventures with overseas companies."

Navigant produced the market assessment impact study for Blackstone Group LP-backed Cheniere Energy Inc.'s application with the Energy Department to export U.S. gas from the Sabine Pass liquefied natural gas terminal in Louisiana.

The buyer in a joint venture agreement usually makes payments to cover drilling costs in exchange for a percentage of ownership in an oil or gas lease and production revenue from that lease. These payments make producers less sensitive to gas prices, said Mark Hanson, an analyst with Morningstar Inc. in Chicago.

#### Shale Formations

"A lot of guys can still afford to drill or move pretty aggressively because they have that joint venture money," Hanson said.

Drilling for gas in shale formations poses difficulties because the fuel is typically buried thousands of feet underground within layers of rock, where temperatures can reach 370 degrees Fahrenheit (188 Celsius) and melt traditional monitoring equipment. Producers use high-pressure jets of water, sand and chemicals in a technique called hydraulic fracturing to break apart the rock and release the gas.

Seneca Resources, a subsidiary of National Fuel Gas Co. in Williamsville, New York, has boosted output by increasing the length of horizontal incisions in shale rock, allowing a single wellbore to

produce gas from a larger area, said Nancy Taylor, a spokeswoman for the company in Erie, Pennsylvania.

#### Hydraulic Feet

Seneca also uses so-called walking rigs, which can move between well sites on hydraulic "feet," allowing the company to drill in multiple locations without dismantling and moving the rigs each time, Taylor said. The company's gas output was up 55 percent in the second quarter from a year earlier, said Matt Cabell, Seneca's president, in a May 6 earnings call.

"Expanded knowledge of the geology, optimized drilling procedures and newer fit-for-purpose 'walking' drill rigs also allow the industry to complete drilling of wells more quickly," Taylor said.

Technology such as microseismic monitoring, which allows producers to identify faults and fractures in rock that may contain gas, and the drilling of several wells adjacent to each other in a practice known as multiwell pad drilling has also contributed to rising gas output, Pickering said.

"One of the things we believe is happening is that the efficiencies of the drilling and production industry have allowed costs to decrease, supporting higher production levels," Pickering said. "We do not see much support for prices beyond \$5 in the next five years or so, with prices in the \$5 to \$6 range expected over the longer term."

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