

America's Energy *Renaissance*

BY J. ROBINSON WEST

*How a surprising combination
of entrepreneurship and
market forces, not government
intervention or big oil,
are saving the day.*

The last decade has seen a remarkable change in the energy narrative in the United States. As we entered the millennium in 2000, U.S. oil production seemed in terminal decline, having fallen by a third from its 1970s peak. The United States needed imports to feed 60 percent of its 20 million barrel per day (and growing) oil habit. In the lower forty-eight states (excluding Alaska and Hawaii), onshore resources had reached advanced maturity, with cumulative depletion of 75 percent. The industry's last best hopes seemed to be to drill increasingly in the deep waters in the Gulf of Mexico and seek access to environmentally sensitive federal lands in Alaska, spurring acrimonious political debate. Yet this story is not one of government intervention or big oil saving the day. It is one of market forces, entrepreneurship, and hard work coming together to create a profound change in U.S. energy in particular and the economy as a whole.

While dire predictions of peak oil in the United States continued, higher prices (by historical standards) and the expectation of sustained higher prices in the long term spurred the development of better technologies and investment in their application. The story begins in the 1990s, when George P. Mitchell, one of many stubborn wildcatters who have written the history of the oil and gas industry, worked doggedly on what many viewed as a quixotic scheme to produce large resources of shale gas (natural gas trapped within fine-grained sedimentary

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rocks) that had long been known to exist, but always seemed beyond the horizon of commercial viability. It was Mitchell and other smaller companies (not the government or the large oil companies) that, by trial and error and a concentrated focus at first in the Barnett Shale near Fort Worth, Texas, were able to combine horizontal drilling (originally pioneered offshore and perfected in the nearby Austin Chalk play), hydraulic fracturing, and other techniques to force gas from shale and other tight formations. By 2001, Mitchell Energy and Development Company had drilled four hundred wells and built over two trillion cubic feet of reserves, and was considered to have the best growth and inventory story among independent exploration and production companies. Larger oil and gas players began to recognize the potential. Devon purchased the company that year in a \$3.5 billion deal that included a 32 percent premium over the stock's market price.

The shale gas revolution has since left the United States both independent and secure in terms of natural gas. Due to its very nature as a gas, the fuel is harder to transport, thus limiting the potential for a globally connected market. Although U.S. gas producers look to make the switch to producing higher-priced oil, gas production remains at record highs, reaching sixty-five billion cubic feet a day in 2012 from around an average fifty-two billion cubic feet a day as recently as 2007—25 percent growth.

The big winners from rising production and lower natural gas prices are consumers. Residential and commercial users have seen tremendously low prices for gas in heating and electricity and domestic industrial users have been granted a new competitive advantage—Germany's BASF, for example, has cited low energy prices in the United States as a reason for expanding operations here. As global oil prices rise, the United States is enjoying the upside of domestic production and witnessing increased domestic economic activity rather than exporting capital, which should have the side effect of strengthening the dollar. This is the first time since the 1960s that the rising price of crude has provided a benefit to the United States—an important break with past experiences.

The new techniques developed for natural gas have been employed in oil and natural gas liquids production as well, creating new energy frontiers in states—the Dakotas, Louisiana, Pennsylvania, Ohio—that had, a decade ago, no hope of developing oil

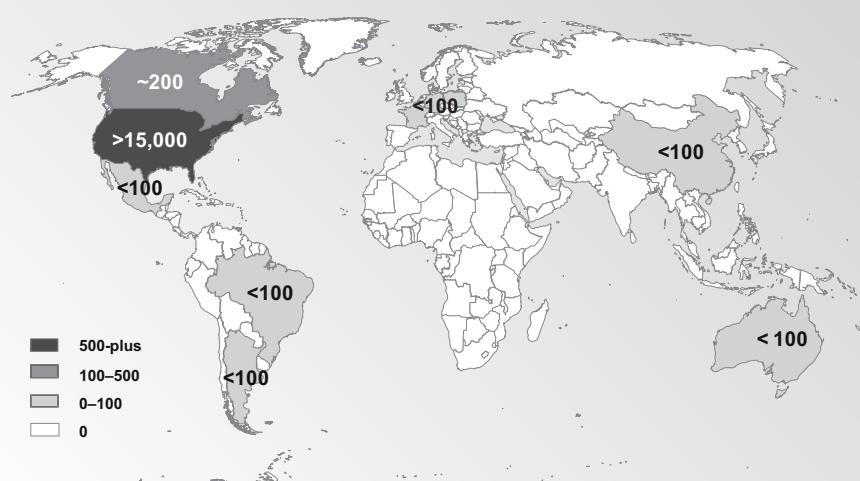
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and gas. This is a major shift for the industry and the country.

While the United States has largely become independent and secure in terms of natural gas, the global nature of oil markets means that the “energy independence”—bandied about by both presidential candidates in the recent election—remains a misnomer as it pertains to oil. Short-term circumstances have created large price differentials between oil produced inland—for instance in the Bakken—and the coast. In the last year, crude produced in the Bakken has traded at up to a \$20 per barrel discount to the price of West Texas Intermediate, a major difference for a fungible commodity. Yet this has spurred an infrastructure-building campaign to develop the country’s ability to both bring crude to major demand centers and export refined products to the global market. Placing this

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Number of Unconventional Wells Drilled, by Country



Source: PFC Energy Global Gas & North American Onshore Group

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in the context of rising global demand—expected to continue placing stress on supply—will mean a higher price of oil everywhere around the world.

This is part of the continuing allure of the U.S. market. Though the Mitchell-Devon deal was the first of its kind, it proved a harbinger of things to come. Devon has subsequently found so much opportunity for growth and inventory in its North American homeland that it has withdrawn completely from international exploration and production, in 2011 completing the sale of its portfolio in one of the world's hottest oil and gas regions, Brazil, to BP. And Devon was at the forefront of a much broader trend. Whereas in the period from 2003 to 2005, North America was the largest generator for the international majors of free cash flow that was invested internationally, the same companies in 2008 to 2010 made a more than \$50 billion (net) investment into North America, by far the largest destination for new capital spending. Although the unconventional plays had begun with small companies like Mitchell, and been continued by exploration and production independents like Devon, most of the big international names have joined the trend in recent years, most conspicuously ExxonMobil in 2010 with its \$41 billion acquisition of XTO. The clear message from this changing narrative is that markets worked.

In spite of the success in North America, this will be harder to replicate elsewhere. We have seen each U.S. play proceed through several stages:

Prove it: The first thirty to fifty wells are needed to prove the producibility of the resource. To be successful, the operator must be creative, often ignoring established practices, and certainly not expecting to make money from the first well, even when that operator has prior successes in other plays.

Optimize it: During this phase, which has typically taken from five hundred to one thousand wells, the operator cracks the code of the specific play, making major gains on key metrics, particularly initial production rates and drilling costs.

Standardize it: At this point, the operator must learn to “manufacture” wells, mass-producing them for scalable production and strong returns.



George P. Mitchell of Mitchell Energy and Development Corp.: The U.S. energy narrative has changed because of people like George Mitchell and powerful market conditions that allowed innovation to work.

The challenge facing those who seek to globalize unconventional oil and gas reserves is that in all countries outside North America, operations are still at the first “prove it” stage. As

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the map shows, no other country has drilled even fifty unconventional wells, let alone five hundred or one thousand.

Will other countries be able to follow the North American example? Certainly, in theory, but not anytime soon. A number of competitive factors spurred the developments in the United States that are not present elsewhere. These include property rights clarity; intensive competition between operators, which spurs innovation; willingness to spend money, including the ability to raise and leverage risk capital; a large, independent, and competitive service sector; supportive local and national governments; a developed infrastructure to gather, process, and deliver gas (a requirement even for liquids plays, which must handle their associated gas); and a market with reasonable prices to purchase the gas.

While the primary issue of the availability of resources is fairly clear, most of these factors are not present in the handful of countries that have begun thinking about developing unconventional oil and gas reserves. There remains significant potential, but it may take decades.

The U.S. energy narrative has changed because of people like George Mitchell and powerful market conditions that allowed innovation to work. Rising production provides the United States with new energy security and surging domestic economic activity. The private sector, not government, drove this historic transformation. ♦