Onshore Access

to Oil and Natural Gas Resources

As our economy rebounds, Americans are going to need all forms of energy, including the vast oil and natural gas resources here in America.

Access to Domestic Sources

Oil and natural gas are vital to our energy and economic future.

America needs a balanced energy policy that promotes energy efficiency, conservation and greater supplies of all forms of energy, including domestic oil and natural gas. The industry has proven it can develop these resources safely and in an environmentally responsible manner in all regions, including on non-park federal lands.

Production of resources from federal lands is essential to providing energy resources necessary to grow the U.S. economy, enhance U.S. energy security, spur the creation of new high-paying American jobs, increase revenue to the federal, state and local governments and improve the U.S. balance of trade. The United States spent $453 billion on imported crude oil and other related petroleum products in 2008, according to the U.S. Census Bureau.[1]

According to an ICF International study, developing America's vast domestic oil and natural gas resources that were kept off-limits by Congress for decades could generate more than $1.7 trillion in government revenue over the life of the resources. Developing these resources will also provide 160,000 new jobs in 2030.[2]

That same new study estimates that if the federal government opened up access to non-park federal land in both Alaska and a portion of the Rocky Mountain states, in 2030 the United States could produce 1.125 million barrels of oil per day and an additional 2.4 billion cubic feet of natural gas per day.

There could be much more oil and natural gas onshore than previously known in areas where industry has been unable to fully explore, and new technologies allow us to access resources previously thought unreachable. There are many examples of how the government's initial estimates dramatically underestimated the amount of actual resources. For example:

- Alaska's Prudhoe Bay oilfield has produced more than 15 billion barrels of oil and natural gas liquids, and is still producing. Government agencies initially forecast the region would produce no more than 9 billion barrels total.
- In the Bakken Formation of North Dakota and Montana, the U.S. Geological Survey now estimates that the resource may contain up to 4.3 billion barrels of technical recoverable oil – a 25-fold increase over previous estimates.[3]

1 U.S. International Trade in Goods and Services, U.S. Census Bureau, U.S. Department of Commerce, February 11, 2008.

2 ICF International Study, *Strengthening Our Economy: The Untapped U.S. Oil and Gas Resources*, December 2008.

3 USGS Newsroom, April 10, 2008. 3 to 4.3 Billion Barrels of Technically Recoverable Oil Assessed in North Dakota and Montana.

Cover photo courtesy of Devon Energy.

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Benefits to the States

Oil and natural gas resources are found in 33 states, and production on non-park federal lands has brought billions of dollars of revenue into federal and state treasuries.

These revenues include both the bonus bids companies pay up front to lease federal lands, both on land and in federal waters, as well as the royalties companies pay on the production on these lands. By law, half of the oil and natural gas receipts collected for production in a particular state are returned to that state.

According to the U.S. Department of the Interior, in fiscal year 2008, the agency distributed a record $23.4 billion to the federal government, states and American Indians from onshore and offshore energy production. Nearly $22 billion of that amount came from oil and natural gas production.

A total of 35 states received $2.6 billion from these revenues[3] (see list below).

3 U.S. Department of the Interior, November 20, 2008, press release.

Alabama	$ 15,836,221.38*	Nebraska	$ 40,800.27
Alaska	$ 38,556,903.53	Nevada	$ 17,622,148.72
Arizona	$ 266,834.26	New Mexico	$ 614,829,204.51
Arkansas	$ 13,189,227.20	North Dakota	$ 23,392,224.43
California	$ 103,445,963.15	Ohio	$ 574,971.75
Colorado	$ 178,377,966.07	Oklahoma	$ 7,240,652.39
Florida	$ 6,298.00	Oregon	$ 294,100.53
Idaho	$ 1,978,855.53	Pennsylvania	$ 69,368.41
Illinois	$ 286,561.67	South Carolina	$ 277.50
Indiana	$ 191.50	South Dakota	$ 1,200,905.81
Kansas	$ 2,605,367.43	Tennessee	$ 99.00
Kentucky	$ 508,473.37	Texas	$ 21,674,057.42*
Louisiana	$ 49,466,635.80*	Utah	$ 173,839,327.76
Michigan	$ 1,171,444.97	Virginia	$ 227,154.44
Minnesota	$ 13,030.27	Washington	$ 202,943.33
Mississippi	$ 1,572,333.15*	West Virginia	$ 776,251.48
Missouri	$ 4,561,311.95	Wyoming	$ 1,270,987,013.51
Montana	$ 48,943,889.42		

* Beginning in 2008 Alabama, Louisiana, Mississippi and Texas receive 37.5 percent of all the revenue collected by the MMS from offshore leases in addition to the royalties from onshore operations.

Not-so-Idle Leases

Exploration is not a risk-free proposition, but it is an essential part of the energy business.

The purchase of a lease is always a gamble. Technology shows us where accumulations of oil and natural gas might exist, but the only way to know if there are commercially viable prospects is to explore.

Sometimes when a lease is not producing, critics claim it is “idle.” Much more often than not, non-producing leases are not idle at all; they are under geological evaluation or in development and could become an important source of domestic supply.

Companies purchase leases hoping they will hold enough oil or natural gas to benefit consumers and become economically viable for production. Companies can spend millions of dollars to purchase a lease and then explore and develop it, only to find that it does not contain oil and natural gas in commercial quantities. It is not unusual for a company to spend in excess of $100 million only to drill a dry hole. The reason is that a company usually only has limited knowledge of resource potential when it buys a lease. Only after the lease is acquired will the company be in a position to evaluate it, usually with a very costly seismic survey followed by an exploration well.

If a company does not find oil or natural gas in commercial quantities, the company hands the lease back to the government, incurs the loss of invested money and moves on to more promising leases.

If a company finds resources in commercial quantities, it will produce the lease. But there sometimes can be delays – often as long as 10 years – for environmental and engineering studies, to acquire permits, to install production facilities (or platforms for offshore leases) and to build the necessary infrastructure to bring the resources to market. Litigation, landowner disputes and regulatory hurdles also can delay the process.

Unconventional Resources

Coalbed natural gas and shale gas resources are a valuable part of the nation's energy portfolio.

Coalbed natural gas, sometimes called coalbed methane, and shale gas are called "unconventional gas" simply because they are found in formations that do not allow the gas to flow or migrate easily. But natural gas produced from these formations account for a substantial amount of U.S. natural gas production.

Coalbed natural gas is found throughout the Mountain West and now accounts for about 8 percent of the (dry) natural gas production in the U.S. Coalbed natural gas is a naturally occurring methane gas with small amounts of carbon dioxide or nitrogen found in coal seams. It is often produced at shallow depths from coal formations through a well bore that allows gas and large volumes of water to be produced.

Because coalbed natural gas can be reached at shallow depths, the wells drilled to produce it are usually completed in several days.

- The San Juan Basin is the most productive coalbed basin in North America, totaling 1.1 trillion cubic feet in 2006. The area is about 9,000 square miles in northwestern New Mexico and southwestern Colorado, and it contains about 30,000 producing wells.

- The San Juan Basin supplies 6 percent of the nation's total production and is California's largest supplier of natural gas.

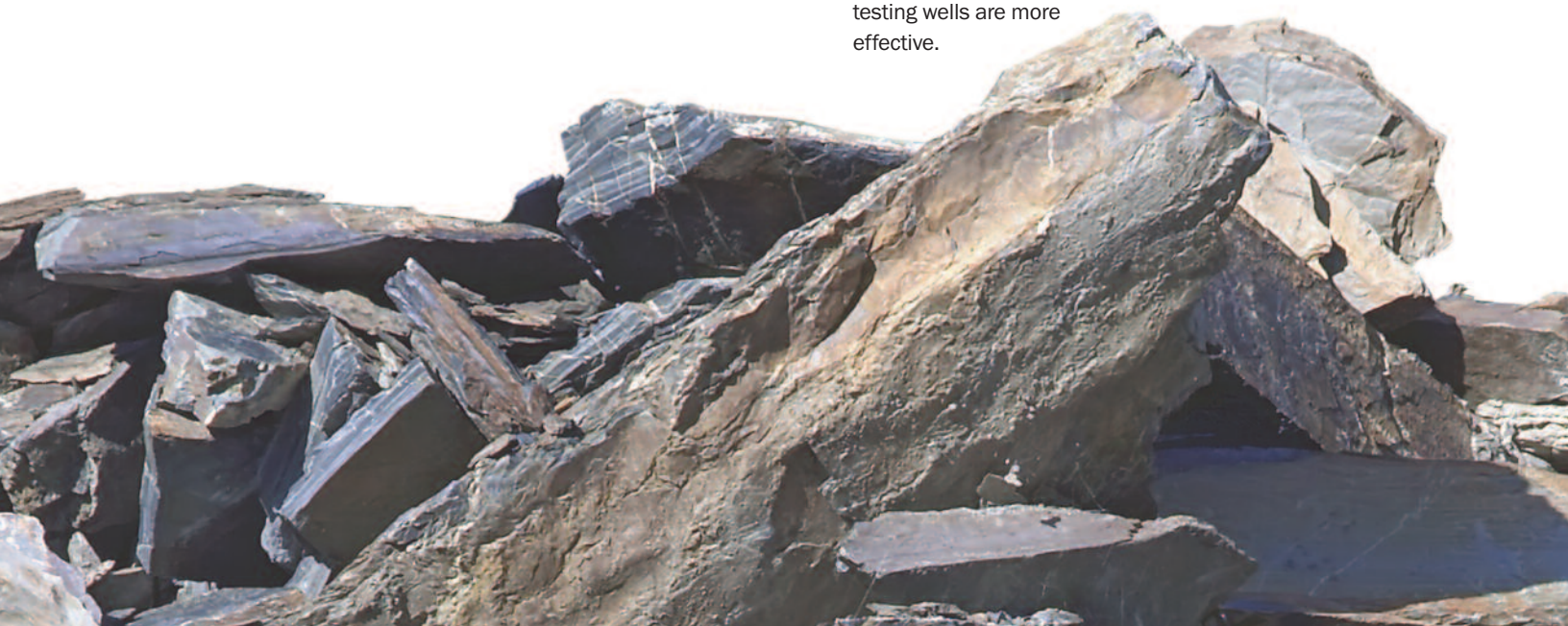
Shale gas is currently the third largest commercial production source of unconventional gas. While it is abundant, it is the most difficult to produce. The gas is typically adsorbed onto clay particles or contained within microscopic pores.

Shale gas formations are often continuous, so a key technique in the cost-effective development is identifying the "fairways" – those areas that have a great concentration of accessible gas. Two important technologies make development of these fields possible: advanced 3D seismic technology, which is often used to identify these areas, and hydraulic fracturing.

- The Barnett Shale in North Texas has emerged as the largest natural gas field in Texas. Companies developed innovative techniques to crack open the shale to release the natural gas sealed inside.

- In northwestern Louisiana, industry interest is focusing on the Haynesville Shale, a new gas exploration play found at depths of 11,500 to 13,000 feet over an area extending 70 to 80 miles.

- The newest center of exploration activity is the Marcellus shale in the Appalachian Basin, which stretches from West Virginia through Pennsylvania and Upstate New York. In 2006, the U.S. Geological Survey estimated the technically recoverable natural gas resources to be some 31.42 trillion cubic feet of natural gas plus some 562.07 millions of barrels of natural gas liquids. The rugged terrain and thick cover make 3D seismic operations difficult, so in these areas drilling and testing wells are more effective.



Unlocking Resources through Science and Technology

Technology has revolutionized the search for oil and natural gas.

Science and technology enables America's oil and natural gas companies to access more resources from more challenging geologic conditions and from more remote places – some previously unreachable – with greater safety and efficiency, and with significantly less impact on the environment.

SEISMIC: Three dimensional seismic techniques provide industry scientists with data that offer detailed information about the rocks below and their capability to contain concentrations of oil or natural gas. With ultra-modern computer imaging, 3D seismic enables geologists and geophysicists to "see" the subsurface in three dimensions. As a result, exploration drilling is more carefully and more accurately targeted. A much higher percentage of exploration wells now find oil or natural gas than was the case just a couple of decades ago. This benefits the environment because fewer unsuccessful wells are drilled.

ADVANCED DRILLING TECHNIQUES: Precision drilling has dramatically reduced the surface footprint. These advancements include horizontal and directional drilling to reach resources way beyond the drill site, sometimes up to four miles from the drilling location. In the past, wells were only drilled vertically, requiring many more drilling rigs to produce the same amount of resources.

- In North Dakota, wells are drilled to 9,000–10,000 vertical feet, then reach horizontally for distances up to two miles, threading the 30 foot wide Bakken shale to allow the best opportunities for producing the crude oil the Bakken contains.

Flexible rig technology allows companies to drill multiple wells from a single rig on the surface.

- In western Colorado "flex rigs" drill as many as 22 directional wells from a single pad, finding natural gas accumulations contained in the complex weave of river channels laid down hundreds of millions of years ago.

With the advancements in computerization, sophisticated sensing and measuring tools provide real-time information from the wellbore back up to the operators during drilling operations. These "bottom hole assemblies" are attached at the end of the drill pipe and they are linked directly to the motors that power and provide rotation to the drill bit. Based on this real-time information, operators make decisions on the direction of the drilling.

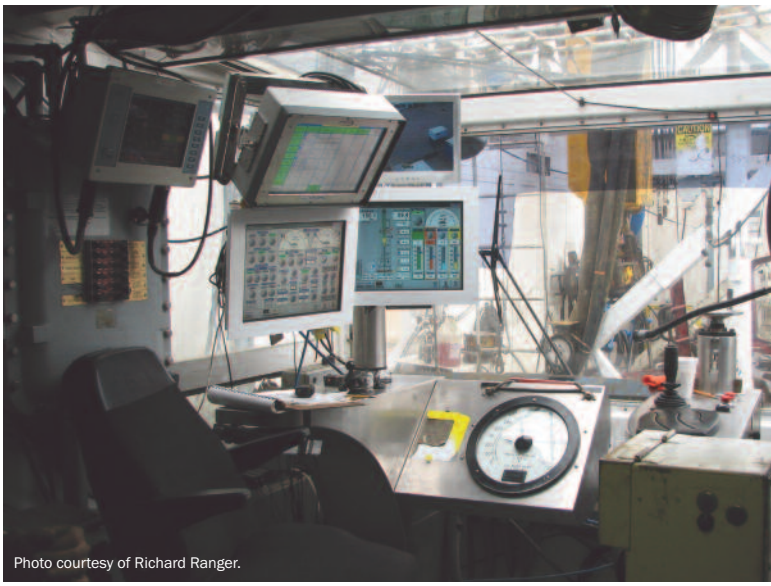


Photo courtesy of Richard Ranger.

A host of developments in materials used in the drilling process, in improvements to horsepower and drilling tools and equipment, computing capabilities on the rig, and instant telecommunications between remote rig location and home office have improved the performance and integrity of drilling operations. Photovoltaic solar panels installed on the pipe and valve assemblies of completed producing wells provide electric power to equipment that monitors well conditions, and transmits data real time from hundreds of wells to a central field office, or to reservoir engineers in a company office hundreds of miles away.

Skilled and experienced personnel operate today's modern drilling equipment and systems under strict regulatory oversight. In addition they are trained to comply with rigorous company policies and procedures that address safety, knowledge of environmental rules and practices, the ability to respond to emergency situations, and the measures that are most effective in preventing emergencies from occurring.

Hydraulic Fracturing

Hydraulic fracturing has been around more than 50 years and has been used in nearly 1 million wells in the United States. It's safe and it's effective in producing more of America's natural gas resources.

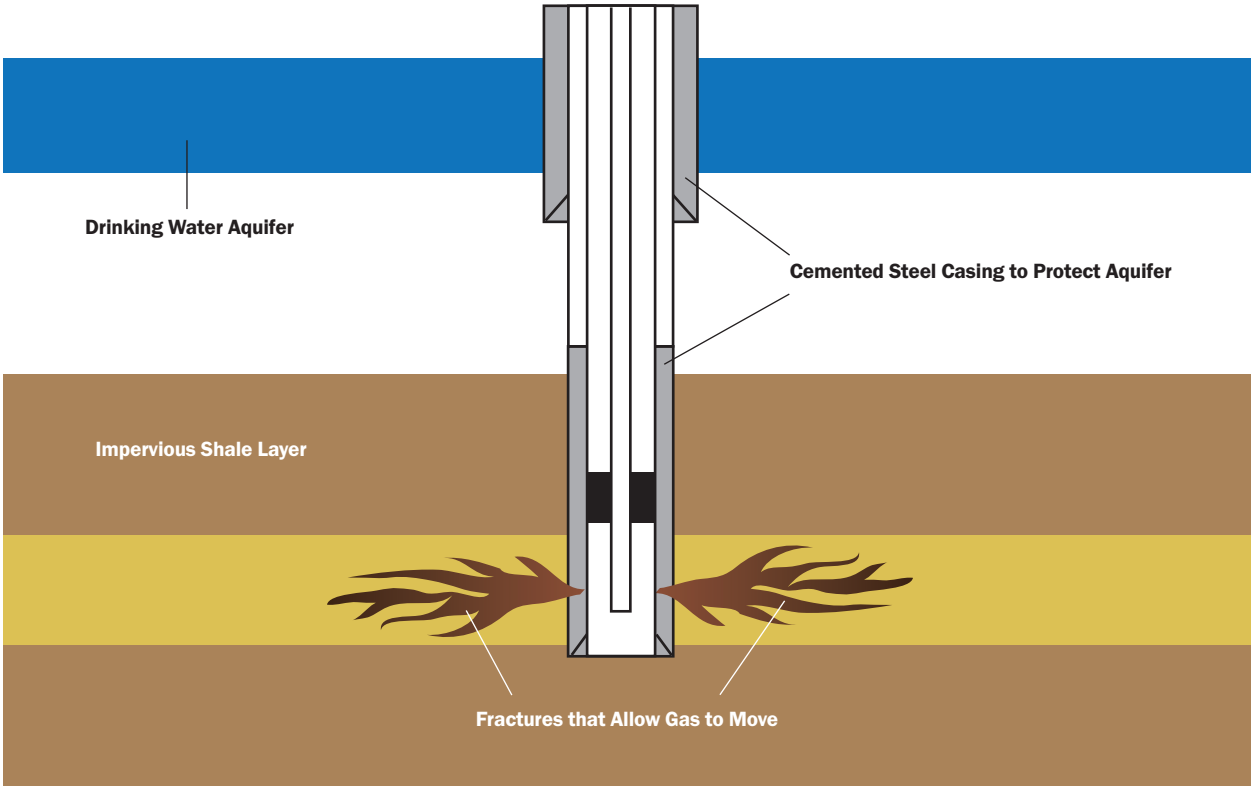
While America has tremendous natural gas resources, most cannot be produced without this technology. According to the U.S. Department of Energy, using the technique of hydraulic fracturing, the United States has been able to produce more than 7 billion barrels of oil and 600 trillion cubic feet of natural gas. And a 2006 government-industry study found that 60 to 80 percent of the wells to be drilled in the next decade will require hydraulic fracturing.[4]

This technology pumps fluids at high pressure into underground formations located thousands of feet below the surface to create fractures in the producing formation to allow natural gas to flow into a well. A combination of water, sand and a small amount of additives make up the fracturing fluids. The sand acts as a "proppant" to hold the fractures open. As the gas rises, it drives most of the fluids back out of the well. The fluids are either recycled or carefully disposed of under state and federal law.

State regulation of hydraulic fracturing has been in place for more than 50 years. Together with industry standards, the regulations effectively protect groundwater. Current industry well design practices provide multiple levels of protection between any sources of drinking water and the production zone of an oil and gas well. For example, wells are carefully constructed using steel pipe cemented to the surrounding rock to ensure isolation and protection of any subsurface drinking water sources.

In 2004, the U.S. Environmental Protection Agency concluded "the injection of hydraulic fracturing fluids into coal-bed methane wells pose little or no threat to (underground drinking water)." The agency, in a review of incidents of drinking water well contamination believed to be associated with hydraulic fracturing operations, found "no confirmed cases linked to fracturing fluid injection of CBM (coalbed methane) wells or subsequent underground movement of fracturing fluid."

4 *Facing the Hard Truths About Energy,* the National Petroleum Council, 2007.



Environmental Stewardship

Responsible development includes good relationships with our neighbors, a commitment to environmental protection, and compliance with all applicable federal, state and local regulations.

Technological advancements allow the oil and natural gas industry to conduct operations far more efficiently and with a greater sensitivity to the environment.

Onshore, these protections include:

- Seismic imaging, which provides eyes underground to better assess both the location and the quantity of the resource.
- Technological advancements in drilling that allow companies to drill more precisely, leading to fewer drilling rigs on the surface and a smaller "footprint" on the land.
- Safety devices, such as blowout preventers, that protect workers, the environment and the community.
- Remote monitoring, which allows production operations to be monitored electronically, reducing traffic to and from the production sites.
- Reclamation of the land once the drilling rig is moved and production equipment is in place.

The companies that make up the oil and natural gas industry also have been recognized by state and federal agencies and conservation organizations for projects to enhance habitat and the environment that demonstrate the sustainable coexistence of wildlife and energy development.

Responsible development also includes good relationships with both the landowners and neighbors. Based on work originally done by the oil and natural gas industry in New Mexico, the American Petroleum Institute developed a guidance document that outlines how the companies that develop resources can be good neighbors, whether they are working out in rural areas or within city limits.[5]

5 API Bulletin 75L, *Guidance Document for the Development of a Safety and Environmental Management System for Onshore Oil and Natural Gas Production Operations and Associated Activities*, October 2007. This document is available at www.api.org.

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