

- ❖ Will Texas be able to tap the market potential of an underground gold mine?

Introduction

New natural gas discoveries in Texas and nearby states are causing many people in the energy industry to reevaluate the commodity fuel. The United States has 35% more natural gas reserves than was thought to exist just two years ago. Economists at the Colorado School of Mines estimate that the United States has enough natural gas to last the next 118 years. This enormous supply has helped push natural gas prices down — to \$3 per thousand cubic feet in mid-2009 from the previous year's high of \$13. Industry leaders are watching to see if the lower prices lead more consumers to switch to natural gas to power their vehicles and other needs.

In 2004, Texas produced 5.1 trillion cubic feet of natural gas. Texans consumed only 3.4 trillion cubic feet, and the natural gas companies exported the rest, according to the U.S. Energy Information Administration. From 2004 to 2008, new drilling technology helped gas companies open shale deposits near Fort Worth and then across Texas for natural gas extraction. Natural gas production rose 37.5% by 2008. According to estimates by energy economists, the extractable natural gas deposits in Texas doubled in just the past four years.

Still, natural gas production has stalled as producers wait for prices to rise to a profitable point.

What's Happening

The 2008–2009 recession, in which extreme structural changes and cyclical downturns converged, was especially bad timing for the natural gas industry. As new drilling technology opened huge

shale deposits under the ground in Texas, Pennsylvania, Colorado and elsewhere in North America, oversupply caused natural gas prices to plummet to the point that the industry came to a virtual standstill. The low price of natural gas may be attractive to consumers, but Americans are not buying more natural gas-powered automobiles or building new homes outfitted with gas.

The automobile industry drives a lot of innovation in America and creates much of the demand in the energy industry. But the auto industry has been in its own disarray, and automakers have been unable to deliver natural gas vehicles to the market.

“The logic for natural gas is overwhelming as energy for homes, power plants and automobiles,” said one Houston energy executive. “Logic would tell us that the invisible hand would push us toward natural gas. But it hasn't happened. The natural gas industry is in a wait-and-hold mode. The industry is not adding more natural gas pipelines. And there has not been increased demand.”

According to industry experts, the tipping point at which gas is both profitable to extract and distribute and cost effective for residential and industrial consumers is \$6. If prices stabilize at a point where the natural gas industry can move forward, Texas stands to benefit. Texas is home to 9 of the 20 largest natural gas producers in the United States. These include ConocoPhillips, Anadarko Petroleum, XTO Energy, ExxonMobil, EOG Resources, Apache, El Paso Energy, Newfield Exploration and Marathon Oil.

Oil billionaire T. Boone Pickens pushed his Pickens Plan in an effort to make the United States more energy independent by 2018. His plan calls for a \$1 trillion federal and state investment along with private

Sources of Electricity Generation in Texas

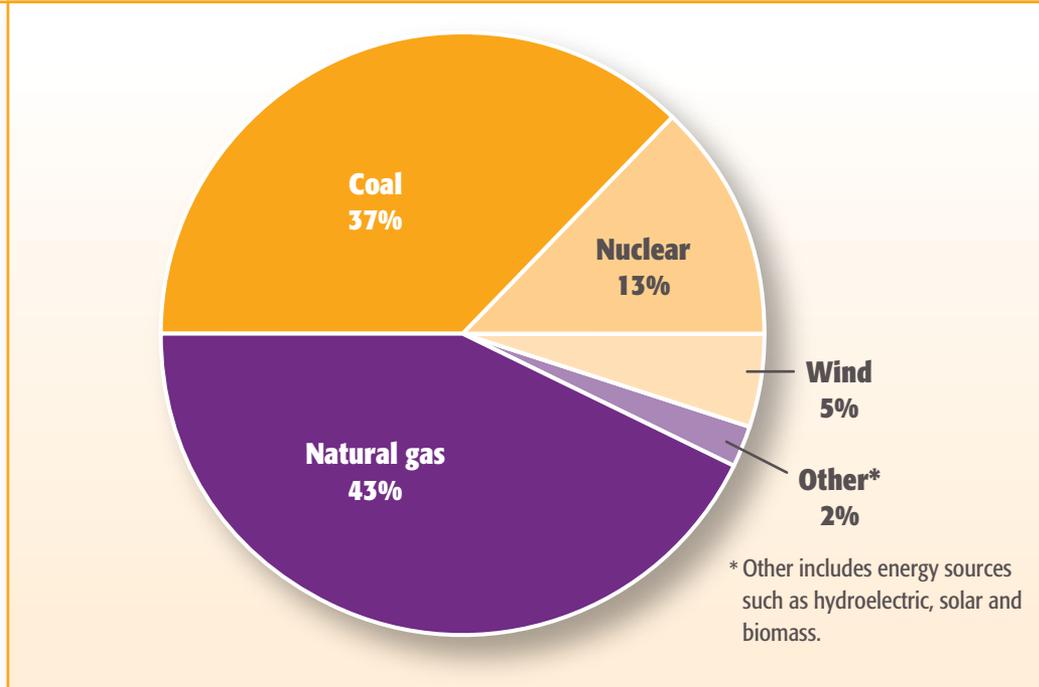


Figure 17.1

investments to build wind farms across the Great Plains as well as new service stations to fuel natural gas-powered vehicles. The Pickens Plan focuses on domestic natural gas as a clean, plentiful (but finite and nonrenewable) energy supply to bridge consumers until nuclear, hydrogen and renewable energy sources, such as wind and solar, fully replace fossil fuels. President Obama endorsed the plan, and 14 governors (including Texas Governor Rick Perry) signed it at the 2009 winter meeting of the National Governors' Association. Even leaders at the Sierra Club called the Pickens Plan extremely aggressive. Pickens has backed off a bit from his plan because wind power transmission lines are proving costly and Americans are still not flocking to new natural gas vehicles. Still, Pickens proclaims natural gas adoption by American consumers will soon grow.

Many U.S. utilities executives express interest in shifting from coal-fired power plants to less-polluting natural gas-fired generators. This shift has already started in Texas. In 2008, the Electric Reliability Council of Texas, which runs the ERCOT electric grid for 85% of Texas, reported the

sources of electricity generation, as shown in **Figure 17.1**.

The Data

Employment in the combined oil and natural gas industry dipped from the highs reached in 2008 due to business cycle changes, but the combined industry grew during the past decade, according to data compiled by the Texas Workforce Commission (TWC).

More than 6,000 well operators are actively registered with the Texas Railroad Commission. They operate more than 74,000 natural gas wells and gas-fired utility plants, which generate 15.5 million megawatt hours of electricity annually — or 26% of the total U.S. share. The combined oil and natural gas industry entered January 2000 with 65,500 workers in Texas and, despite the recession, employed more than 75,000 workers in the fall of 2009. On the flip side, natural gas pipelines and distribution industries declined by 8,901 jobs between the first quarters of 2001 and 2009, according to TWC data.

Known Reserves of Natural Gas, 2007

Location	Volume (billion cubic feet)	U.S. Total (%)
United States	237,726	100%
Texas	72,091	30.3%
U.S. federal offshore waters	14,439	6.1%

Table 17.1

SOURCE U.S. Energy Information Administration.



“Texas could also benefit from enhanced infrastructure with Mexico to increase natural gas exports south of the border. Mexico is hungry for gas.”

— *Michael Economides, University of Houston*

Along with employment, the level of natural gas reserves is also growing. **Table 17.1** shows known Texas reserves of natural gas, which make up 30% of the nation’s total natural gas reserves. Another 6% of the nation’s reserves lie in federally controlled coastal waters. Despite these reserves, the Texas natural gas production peaked in 1972 at 8.6 trillion cubic feet then declined steadily through 2004, chiefly because the cost of production was too high relative to market pricing.

However, the industry is changing. Additional new natural gas reserves have been discovered. In 2003, explorers made 174 new natural gas discoveries, and in 2008 gas companies marketed more than 6.9 trillion cubic feet of natural gas. New techniques have created more cost-effective methods of gas extraction, and new exploration technology has identified reserves of unconventional gas, such as coal bed methane and shale gas reservoirs. Natural gas now fuels most electric plants in Texas. But while the cost of production has fallen, market prices have fallen to an even greater extent.

| So What?

“Energy will continue to be a key driver of the Texas economy; there’s no two ways about it,” said the president of an oil and gas exploration firm in Midland. “Oil and gas have been paying a lot of the bills in Texas, and that will continue, especially for gas.”

“Our studies in the United Kingdom show that, everywhere wind energy was built, demand for natural gas went up,” said Michael Economides, an international energy consultant and petroleum engineering professor at the University of Houston who claims that natural gas turbines at power plants can fire up within hours to meet power demands. “Alternative energy needs the support of natural gas. Wind turbines make people feel good, but wind turbines don’t provide power all day long,” continued Economides.

“Texas could also benefit from enhanced infrastructure with Mexico to increase natural gas exports south of the border,” Economides said. “Mexico is hungry for gas.”

The hottest areas for natural gas extraction and exploration are in the Barnett Shale and Fort Worth Basin in the North Texas area; the Overton, Carthage, and Joaquin fields and the Bossier Sand in East Texas; and the Hugoton field and Granite Wash in the Panhandle region. All of these areas are seeing increased employment in and revenue growth for oil field service companies and oil and gas extraction. Comparable employment growth has not yet occurred in the pipeline and transportation, petroleum merchant wholesaling and natural gas distribution sectors but could likely follow. However, current exploration and drilling activities are stopped just before extraction begins as Texas producers wait for the international market to push the price of natural gas into a higher profit range.

Chapter 17 | Suggested Strategies



Think Globally, Plan Regionally

Texas has 42 of the 100 largest natural gas fields in the United States, according to the U.S. Energy Information Administration. Texas also has an abundance of natural gas at a time when American political interests are pushing the country away from “dirtier” energy sources, such as oil and coal. Natural gas creates about half as much harmful emissions as its rival energy sources.

Pummeled by low prices and unchanging demand, the natural gas industry in Texas is frozen. But that can change because sustained low prices tend to attract demand.

If Texas wants to grow its natural gas industry, the state could consider expanding its natural gas infrastructure. Assisting in the building of new gas service stations to supply natural gas-powered automobiles and pushing for liquefied natural gas terminals a few miles off the coast in the Gulf of Mexico (federal authorities have permitted eight such terminals for Texas) could propel the industry forward.

While Texas waits for natural gas demand to rise, the Lone Star State can tap other gases within its borders, including methane, which is produced in vast amounts in municipal landfills, wastewater treatment systems and feedlots. The technology exists to capture, purify and use methane for generating heat and electricity, and methane can eventually be used as another source of hydrogen. Regions should look beyond current funding resources and pursue outside grants and private funds to promote methane-based combined heat and power systems.

Furthermore, geothermal-powered electricity can be used to meet the off-grid power supply needs of the drilling rigs and pumps, creating self-powered drilling equipment and lowering extraction costs. Regional economic developers, state officials and even those in charge of the Emerging Technology Fund could consider providing financial incentives to firms in the oil and gas extraction and services industries so they can modify their equipment and processes to tap geothermal energy. Federal funds have been set aside under the Environmental Policy Act of 2005 for geothermal research and development. Texas researchers and entrepreneurs, with the help of the Governor’s Office for Economic Development, local workforce boards and economic development organizations, could aggressively pursue those funds.

Proponents of natural gas argue that it is the most underused fuel source in the marketplace. Although many commercial companies and public utilities have substituted natural gas vehicles for buses, trash trucks and other diesel-burning heavy equipment at significant cost savings, few Texans have followed suit with passenger cars. Honda makes some of the few production passenger cars that run on natural gas. It is unclear if or when the market for a natural gas car will improve. In the meantime, as Texans look for all manner of energy alternatives, natural gas looks like it will remain a potent and viable option for a century.