What role will the Texas oil industry play in a diverse energy economy?

Introduction

The Texas oil and gas industries have always been a boom-and-bust proposition. Between the first quarters of 2005 and 2009, this industry enjoyed a boom period, adding 19,346 payroll jobs. Then, in the latter half of 2009, the industry in Texas contracted, resulting in huge layoffs. That year, many oil and gas field workers arrived at unemployment offices to receive another shock: those who had only a high school diploma and those who had dropped out of high school qualified for only entry-level jobs, which paid about $25,000 a year, well below the $60,000 a year they had been earning. And with the current structural changes in the oil industry, many of the high-paying oil jobs may not be returning.

In the oil industry, technological skills are increasingly replacing brute strength in the location, extraction and refinement of oil.

“Years ago we hired people from the neck down; we wanted strong backs,” said Greg Yoxsimer, human resources business partner for Chevron oil and gas operations in Midland. “Now we hire people from the neck up. Only a few years ago we hired people and gave them a shovel and a pipe wrench and told them these were the tools that will make them successful. Now we hire people and give them a volt meter and a computer and tell them these are the tools that will make them successful. It’s a different industry now.”

Yoxsimer is making preparations with West Texas community colleges to hire 35 workers during the next two years. These workers need an Associate’s degree in electronics, mechanics, hydraulics or instrumentation. Yoxsimer hopes to replace the Baby Boomer employees who are expected to retire in the next five years, during what the industry is calling the Great Crew Change.

“We’ve got to prepare for the Great Crew Change,” Yoxsimer said. “I have pent-up retirement demand in older workers once their 401(k) plans improve.”

What’s Happening

Demand for gasoline and diesel fuel in the United States dipped slightly in 2009 due to the national recession. Oil prices fell from a high of $147 a barrel in the summer of 2008 to less than $35 a barrel in spring 2009, causing Texas oil companies to initiate cost-cutting measures. Shell and ConocoPhillips began massive restructuring efforts in 2009 to cut costs and trim their workforces. The buildup and sudden drop in oil prices also prompted the oil refineries to put their expansion plans on hold. Oil and gas companies began reevaluating their futures in the face of less

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demand in North America, rising demand in Asia and uncertainty regarding national and worldwide pollution laws. While oil prices climbed back to $80 a barrel in the spring of 2010, oil companies continued reevaluating their staffing needs and the skill sets of their workers.

Despite an overall reduced demand for oil in North America, demand for oil in the United States isn’t going away. Oil provides more than 40% of all the energy used in the United States, according to the U.S. Department of Energy. The United States has 250 million automobiles and trucks (by comparison, China has about 25 million vehicles). American drivers consume 179 billion gallons of fuel a year. Texans play a big part in the U.S. oil consumption numbers: Texas uses about 12% of all the oil in the nation, followed by California (8%) and Florida (5%).

Texas oil reserves don’t match its consumption. Although Texas remains the leading oil-producing state in the nation, with new oil discoveries in the Gulf of Mexico, the “easy oil” is gone, according to executives in the Texas oil industry. “The gushers are gone. Texas has an estimated 15 more years of petroleum under the land, but getting it out of the ground will mean digging deeper and spending a lot more money.” The lack of oil below ground, the recession and new technology that has replaced workers contribute to the decline in employment in the Texas oil industry.

Meanwhile, oil companies have moved aggressively to develop and buy up alternative energy properties. Dallas-based Hyperion Resources received approval to construct a $10 billion oil refinery in South Dakota. Hyperion’s new refinery will use innovative technology to convert tar sands crude oil into low-sulfur gasoline, with lower emissions than traditional refineries. Hyperion’s new facility near Sioux Falls will be the first oil refinery built in the United States since 1976. In addition, three Texas refineries are moving forward with their own billion-dollar expansions: Motiva Enterprises LLC is set to expand its oil refinery in Port Arthur, TOTAL Petrochemicals is expanding its heavy and sour crude processing capacity also in Port Arthur, and Pasadena Refining Systems Inc., in conjunction with partner Petrobras, is expanding its Pasadena refinery.

Texas oil workers are also directly affected by world events, now more than ever. Some current global trends are helping Texas workers in traditional energy sectors. For example, worldwide demand for drilling products is causing Dick Sivalls to hire more workers and ask his current workers to put in overtime. Sivalls is president of Sivalls Inc., an Odessa-based maker of drilling equipment. Demand is up from natural gas companies in the United States and from Russian oil companies that

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are pushing forward with oil exploration and extraction in Siberia. “[Russian President Vladimir] Putin has them drilling even though oil prices went down. He wants the revenue,” said Sivalls.

The Russians are coming to Odessa (Texas, not Ukraine) to buy their oil field equipment because, like many other Texas suppliers, Sivalls Inc. has decades of engineering expertise. Though he receives half his orders from overseas, Sivalls has no plans to expand outside the United States. “We can’t control quality overseas,” Sivalls said. His company’s plants in Texas are hiring certified welders, machinists and pipe fitters — and giving those workers additional on-the-job training.

### The Data

Although the Texas economy has diversified, oil and gas extraction and support activities for this industry are still integral to the economic base of Texas. Governor Rick Perry identified both industries as economic growth poles within the petroleum refining and energy clusters and critical to the future growth and development of the Texas economy. Texas crude oil reserves make up about a fifth of the nation’s total available oil, spread across roughly 150,000 wells.

Texas Workforce Commission data show the oil and natural gas industry combined with its direct support industries entered January 2000 with 128,400 workers in Texas and reached 188,300 workers in January 2010 — that’s a 47% job growth over the decade. These employment numbers from the U.S. Department of Labor don’t include the many manufacturing support industries that supply the oil and gas industry in Texas. But that’s only part of the story about the impact of this industry on state employment. In March 2010, Texas employed 194,800 workers in the oil and gas extraction and support industries that represented 45% of all U.S. workers in that combined — and cyclical — industry.

The oil and gas extraction industry has been critical to job creation in Texas. One method to determine the criticality or concentration of an industry within a state or region is through a location quotient (LQ). The LQ is the percentage of industry employment in a region versus industry employment in the nation. For the oil and gas industry, the statewide location quotient (LQ) is 6.9, making it one of the highest concentrated industries in the state. LQs greater than 1.2 generally denote industries that are export oriented, and LQs greater than 5.0 are rarely seen, except in situations of extreme concentration, such as tourism in Las Vegas or financial services in New York City. The Texas oil and gas extraction industry contributes more than 67,000 export jobs, with an average weekly wage of more than $3,800. Table 16.1 lists some of the regions with high concentrations of oil and gas employment.
“Affordable energy is an enabler of economic well-being, a cleaner environment and sustained lifestyle choices,” said John Hofmeister, retired chief executive officer (CEO) of Shell Oil and now head of the nonprofit Citizens for Affordable Energy, in a presentation at the University of North Texas. His nonprofit promotes more energy from all sources, more technology and innovation, more environmental protections and more energy infrastructure.

Every U.S. president for the past four decades has spoken of the problems caused by the country’s dependence on imported oil. In 1973, President Richard Nixon called for energy independence to be achieved for the United States by the end of 1980. In 2006, with more than 100,000 American troops in Iraq, President George W. Bush addressed the nation by saying, “Here we have a serious problem. America is addicted to oil, which is often imported from unstable parts of the world.” Bush then called for an end to Middle East imports of oil by 2025.

Each year, more than $100 billion goes from the wallets of American consumers to foreign governments. Periodic oil supply shocks and the frequent swings in oil prices cost American businesses and consumers about $2 trillion in foregone economic activities. This transfer of wealth out of the United States concerns many.

Oil is also helping to strengthen the rivals of the United States, said Michael Economides, international oil consultant and petroleum engineering professor at the University of Houston, who is gaining attention with his warnings about the American energy industry.

Economides said he is concerned that the United States is losing its leverage within the energy industry as Chinese companies buy up oil and gas reserves in Venezuela, Argentina and Canada. In September 2009, Venezuelan President Hugo Chávez signed a $16 billion deal to deliver oil to Chinese energy giant Orinoco. And even with its economy slowing, China’s consumption of gasoline and chemicals is still growing by more than 20% a year. “The Chinese are paying lip service to saving the planet while they’re getting all the oil and gas properties they can,” said Economides, who is a consultant to Chinese energy companies. “That is the biggest transfer of power that we’ve seen in generations. And energy means power.”

Like many tied to the traditional oil and gas industries, Economides questions if alternative energy forms, such as wind and solar energy, can contribute more than a small fraction of the energy needs of the United States. “Without government subsidies, none of these alternative energy forms like wind and solar has a chance. Sunshine is free. Solar energy is bloody expensive,” Economides said. “If you want to subsidize something that makes sense, subsidize the development of new technology in the oil and gas industry.”
Think Globally, Plan Regionally

Concerns about the impending Great Crew Change have grown each year in the oil industry. In 2004, the Society of Petroleum Engineers studied the age of workers in the American oil industry; at the time, the average was 48 years old. Now most workers in the industry are older than 50, and though the Baby Boomers have hung on, many are expected to retire soon. And aligning available worker skills with available jobs is currently problematic in this changing industry.

The first challenge that Texas faces in supporting the oil industry is supplying new workers. Demand from Texas companies for petroleum engineers has been high and is rising amid concerns of the impending Great Crew Change. Oil companies report a need for young workers with new degrees in petroleum engineering. A study by consulting firm Booz Allen showed that fewer younger people were entering the oil industry. The number of petroleum engineering majors fell from 11,000 students at 34 universities in 1993 to about 1,700 students at 17 universities in 2007. Although student enrollment at university petroleum engineering programs recently rose, the number of new petroleum engineering graduates still falls short of the rising demand. For example, Texas A&M University doubled its enrollment in five years at its petroleum engineering Bachelor’s degree program with 608 students in the 2009–2010 academic year compared with five years earlier. Yet that program graduated only 102 students, not nearly enough to meet the market demand in Texas for oil engineers. Learning engineering is hard, but a lack of engineers is a significant constraint on Texas companies and this state’s economy.

Meanwhile, expanding oil refineries say they need more coordination with local workforce officials to locate and train qualified workers. The nature of this boom-and-bust business requires closer coordination between local workforce boards, companies and colleges of engineering. Demand for certified welders and maintenance workers at refineries and nearby chemical plants continues to outpace supply, causing staffing havoc for these employers.

Possible pollution regulation changes also challenge the oil industry. Texas oil companies are lobbying federal lawmakers, but they say they need more help from Texas political leaders. Industry executives say that pollution control regulations need to be adopted gradually, and new taxes on the industry are not welcome.

Texas cannot control the international oil industry but can continue to benefit from this industry if the Lone Star State can provide the brain power to the diversifying oil companies.

The oil industry continues to thrive in Texas and continues to pay Texans high wages. Yet, as both the nation and its oil companies shift to a more diversified energy system that doesn’t rely as much on oil, Texas falls short in educating and graduating enough cross-trained engineers and field technicians for either the oil industry or the greater energy industry. Cross-trained Texans who understand the evolving energy industry can also help innovate Texas oil companies and create new energy companies for the state’s future. Curriculum adjustments are needed at the university level and in high schools where young people need to learn that the myriad of emerging job opportunities in the energy sector require not just a strong back but also a strong mind.