

# Amid National Energy Boom, a Complex Roux in Louisiana

While the need for energy remains a constant, the energy sector has undergone profound changes over the years. Continuing to innovate how to supply energy while remaining profitable is the challenge for southeastern energy producers.

Energy and its price are near and dear to Earl Shipp and Charles Goodson.

Both men make a living in industries whose fortunes largely turn on fuel and its cost. Yet in the spring, Shipp was optimistic about his business prospects. Goodson was not.

Their divergent views of the state of the energy sector are instructive. By most measures, the U.S. energy sector is booming. Oil prices have been high for many months and, while easing recently, are likely to stay that way. Domestic oil and gas production nationwide is up, thanks in part to an explosion in the extraction of natural gas and oil from subterranean shale deposits. The United States is importing less oil, and exporting more. For the energy-dependent Louisiana economy, one might think these ingredients would make a recipe as tasty as crawfish étouffée.

Yes and no.

On the whole, conditions in Louisiana's energy industry are more bittersweet than tasty, primarily because the industry is not homogeneous. Certain fundamental forces—say, low natural gas prices—affect different industry players differently. As head of Dow Chemical's operations in Louisiana and Texas and a former member of the Atlanta Fed's New Orleans Branch board of directors, Shipp welcomes cheap natural gas because it is the base raw material in the thousands of products Dow makes in the Bayou State, ranging from LCD screens for iPads to ingredients in shampoo and lotion. Goodson, on the other hand, is president and chief executive of PetroQuest, an oil and gas producer based in Lafayette, Louisiana. Historically low natural gas prices

mean his company has a difficult time turning a profit on one of its primary products.

"We're in a dysfunctional way," Goodson said.

On balance, Louisiana's energy industry is sufficiently robust that it's bolstering a comparatively strong economic recovery. Employment in oil and gas extraction has rebounded vigorously from the recession and the April 2010 Gulf oil spill. Certain pockets of the industry, such as petrochemicals, steel fabricators, and shipyards, are thriving. At the same time, oil and gas production has actually slipped in the state in recent months (see chart 1 on p. 8). Gas producers like PetroQuest are battling a glut of supply, and some hurt lingers from the post-spill offshore drilling moratorium. These diverse circumstances underscore a reality about Louisiana's energy sector that the public does not generally understand.

"It drives home the fact that this is actually a pretty heterogeneous industry here in Louisiana," said David Dismukes, associate director of the Louisiana State University Center for Energy Studies in Baton Rouge. "That's something most people don't appreciate."

There are more nuances in the Louisiana energy sector than simply different interests among big producers and big consumers. Oil producers, for instance, profit from high oil prices. Yet even the oil producers in Louisiana are not without concerns. For one, the costly but potentially lucrative drilling in the deepwater Gulf of Mexico is still not up to speed after the BP oil spill. Production from the Gulf is about 20 percent below where

it would have been without the six-month moratorium, according to a study by IHS CERA, an energy consulting and information firm. (See the sidebar on offshore production on page 10.)

Throughout Louisiana, 165 oil and gas drilling rigs on average operated during 2011, down from 192 in 2010, and fewer than in all but one other year since 2003, according to Baker Hughes, an oil field services firm whose data are widely followed. Louisiana crude oil and condensate (light oil) production, including in the federal waters of the Gulf’s outer continental shelf, fell 14.7 percent in 2011 from 2010, when production was off 1.6 percent from 2009, state Department of Natural Resources (DNR) figures show.

As for natural gas, Louisiana’s 2011 production increased 12 percent from 2010, when production had climbed 16 percent from 2009 (see chart 2). Onshore production had been generally stable for several years before rising sharply, by 41 percent, in 2010. Onshore gas output then shot up another 36 percent last year.

Increases of that magnitude are not expected to continue, however. The DNR noted that low natural gas prices have already slowed drilling in the Haynesville Shale area of northwest Louisiana. In March, 50 rigs were active in the Haynesville Shale, a 59 percent decline from 12 months earlier, the Louisiana DNR reported.

### Victims of their success

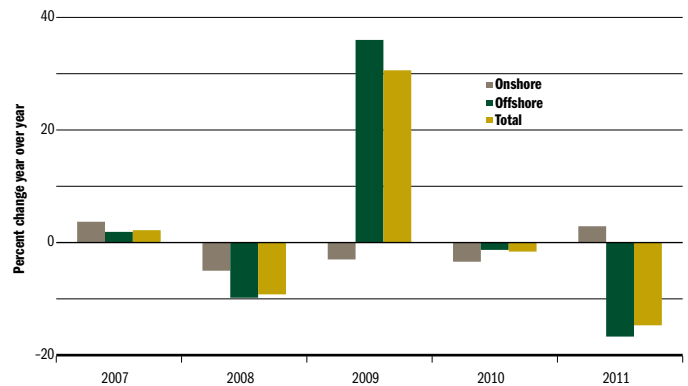
To a degree, gas producers are victims of their own success. Supplies of gas, particularly dry or gaseous natural gas, have overwhelmed demand. In December 2011, for instance, the supply exceeded consumption by 1.8 billion cubic feet per day, about 3 percent of the daily production, according to the Energy Information Administration (EIA). That differential might sound insignificant, but Goodson noted that it means selling some gas at a loss. It is enough of a problem, he said, to force many smaller gas producers out of business or into less than favorable mergers.

One cause of the surplus was a drop in industrial demand for natural gas during the recession. Just as significant, production nationwide has soared by 22 percent in the past five years as sophisticated drilling and rock-fracturing techniques have pried open previously impenetrable shale across the country. Shale is brittle and impermeable, so it must be broken to allow gas and oil to flow through it. Advanced exploration and drilling practices have “taken geologic risk out of the equation,” said Matt Quantz, manager of investor communications for PetroQuest. “You’ll never drill a dry hole in shale.”

That technique represents a quantum leap. As recently as the 1990s, only about 30 percent of all exploratory wells struck oil or gas, according to the U.S. Department of Energy.

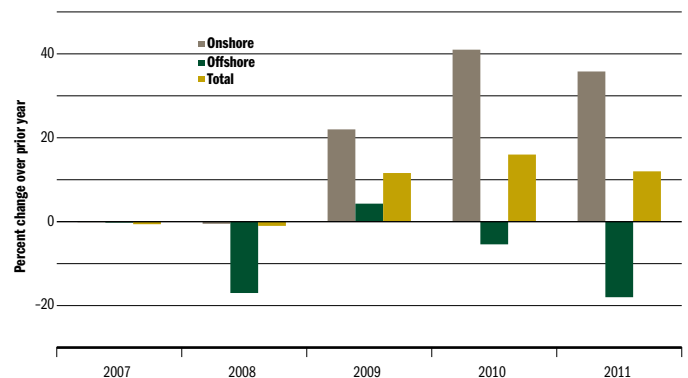
Gas production from the Haynesville Shale formation in east Texas and northwest Louisiana began in 2008. The innovation that made it economical to harvest the long-buried shale gas is hydraulic fracturing. Known as “fracking,” this process

Chart 1  
Louisiana Oil Production



Note: Data include federal waters.  
Source: Louisiana Department of Natural Resources

Chart 2  
Louisiana Natural Gas Production



Source: Louisiana Department of Natural Resources

involves blasting chemically treated fluids that break up the rock and free the trapped gas.

Fracking is typically used along with horizontal drilling. Drillers bore some 2,500 feet into the ground, and then turn the bit and tunnel horizontally a half mile to a mile, then frack the rock, Goodson said. Fracking has become controversial because of its possible impact on air and ground water quality, among other concerns.

But fracking and horizontal, or “directional,” drilling have been undeniably effective at unlocking vast quantities of natural gas, and fast. The newer wells in the shale deposits release an inordinate amount of their output in the first year of production. Then the flow falls dramatically.

## Southeastern Energy Facts

- Cost of operating a drilling platform in 1,000 feet or more of water: \$1 million a day
- Cost of an offshore drilling rig: \$600 million or more
- Miles of oil/gas pipeline in the Gulf of Mexico: about 30,000
- Cost to install pipe in deep water: \$5 million to \$10 million per mile
- Total of winning bids in U.S. government offshore Gulf of Mexico lease sales 2000–11: \$14 billion
- For offshore energy production, the Gulf is divided into three zones: east, central and west. Most activity is in the central zone off Louisiana.
- First offshore Gulf drilling: 1938

Sources: Tulane University Energy Institute, Bureau of Ocean Energy Management, Louisiana Department of Natural Resources

By contrast, older “conventional plays” tapped via traditional vertical drilling produce a steadier flow over time, Goodson said. He explained that a quarter of total production from a well in “unconventional shale plays” typically flows in the first year. After that, the flow rate slows because it takes time for the gas farther from the original reservoir to seep through cracks and to ultimately be taken from the ground. Consequently, the next three-quarters of gas in a typical shale well flows out over some 30 years. This “hyperbolic production”—extremely fast, and then very slow—has exacerbated the supply-demand imbalance by immediately and substantially boosting supplies.

From thousands of wells nationwide, there is simply more gas coming out in the early bursts than there is demand for it. Storage systems don’t absorb much of the surplus because those systems were not designed to accommodate the rapid early production from shale. Rather, the storage systems were set up to hold back gas to smooth out prices amid routine seasonal peaks and valleys in demand. Peak demand is in winter, for heating, and to a lesser degree in the summer, for cooling.

This glut of natural gas has forced prices to historic lows, especially for dry natural gas, which is almost pure methane. Dry gas is also known as consumer-grade natural gas. Prices in early 2012 were about 30 percent of what they were a decade earlier.

“In general, anybody in our sector that is oil-weighted is very happy. Anyone natural gas-weighted is seeing a price structure that is well, well below our costs,” Goodson said.



### Now for the sweet

While natural gas producers grapple with an oversupply, it has not dragged down overall energy employment in Louisiana. Employment in Louisiana’s mining and logging sector—virtually all of it in oil and gas—has in fact climbed 15 percent since the bottom of the recession, data from the U.S. Bureau of Labor Statistics (BLS) show. That performance is the second best among Louisiana’s job categories, behind education and health services, according to the BLS and Atlanta Fed data.

An important element in the Louisiana jobs picture was something that did *not* happen. During the offshore drilling moratorium after the BP spill, the mass layoffs that were widely predicted never materialized.

Lafayette, the most energy-reliant of Louisiana’s eight metropolitan areas, has seen the state’s best job growth since the worst of the recession. Powered by oil and gas extraction jobs, Lafayette’s employment gains in percentage terms more than doubled those of any other Louisiana metro area. Lafayette in March had about 18,000 mining and logging jobs, nearly a third of the state total, and a 16 percent increase from a year earlier, according to the BLS.

Those jobs are significant not just because of quantity. They also pay well and are therefore known to have a large ripple

## Post-Moratorium, Offshore Activity Still Lagging

The six-month drilling moratorium after the April 2010 BP oil spill has set back production in the Gulf by about 20 percent from where it would otherwise be, according to a study by IHS CERA, an energy consulting and information firm. In 2011, oil production from the deep-water Gulf of Mexico—not just off the coast of Louisiana—was down 17 percent from 2010, while gas production was off 19 percent, according to the Bureau of Ocean Energy Management (BOEM). Despite the moratorium, however, the mass layoffs widely predicted by energy companies and some officials in coastal states did not materialize.

Industry observers attribute the offshore slowdown mainly to regulatory issues. The overhaul of the federal agency that issues offshore drilling permits, formerly the Minerals Management Service,

has slowed the permitting process and created regulatory uncertainty, said Eric Smith of the Tulane University Energy Institute. Two agencies now oversee offshore exploration: the BOEM, which manages offshore leasing, and the Bureau of Safety and Environmental Enforcement, which is responsible for permitting and inspecting rigs.

### Industry still enthused about the Gulf

“The economic effects are definitely being felt,” Smith said of the dip in offshore activity following the moratorium. “It’s not for want of interest in drilling holes in the Gulf of Mexico. Everybody is still enthused about drilling in the Gulf.”

In the first quarter of 2012, two dozen rigs were actively drilling in the deepwater Gulf, compared to seven a year earlier, but down from the 32 that were there when BP’s rig exploded and sank, according to Smith and data from IHS Petrodata, an energy research firm. Before the spill, industry participants had hoped the deepwater rig count would

reach 42. Now they hope it will reach 29 by the end of 2012, Smith said.

There are signs that offshore activity is reviving. The permitting process is improving, according to a March presentation to investors by executives of Hornbeck Offshore Services Inc., based in Covington, Louisiana. The total number of rigs operating in federal waters off Louisiana, including those in shallower water, surpassed 40 in late April for the first time since before the six-month moratorium, according to the Louisiana Department of Natural Resources. And Hornbeck executives said the offshore rig count should return to pre-spill numbers reasonably soon.

Energy companies lease areas of the Gulf from the federal government for 10 years at a time. BP, as the biggest leaseholder in the Gulf, holds oil and gas rights on 4 million acres of ocean floor. In U.S. federal waters of the Gulf, 32 million acres—roughly the size of Louisiana—are leased by exploration companies, according to the BOEM. ■

effect. Lafayette’s mining jobs in 2010 paid \$81,000 a year, on average, while in New Orleans they paid \$111,000, according to the most recent data from the Louisiana Workforce Commission, formerly the state’s Department of Labor.

### Bending plenty of steel

Ironically, some workers and companies that serve the offshore drillers benefited from the 2010 moratorium. A prime example is Houma, Louisiana-based Gulf Island Fabrication Inc. Gulf Island builds offshore platforms and other structures for oil and gas production. When much of the drilling in the Gulf was halted, the producers prepared for the resumption of work after the moratorium, said Kerry Chauvin, chairman and chief executive officer of Gulf Island and a member of the Atlanta Fed’s Energy Advisory Council. (Shipp and Goodson are also members.)

Gulf Island has roughly doubled its employment to 2,300 in the past 18 months. The company is busy with a record \$630

million backlog of work, headlined by a \$300 million, 25,000-ton offshore platform it is building for a major oil company.

### Louisiana also a major energy consumer

Companies that service oil and gas producers are not the only winners in the current cycle. Cheap natural gas is a tonic for major gas users—no small matter in Louisiana. In addition to its position among the nation’s top energy producers, the state is a prolific consumer, in part because of its large petrochemical industry. Louisiana in 2009 was third behind Wyoming and Alaska in energy consumption per capita, using energy at twice the rate of the United States overall, according to the EIA.

Consider Dow Chemical. The company spends more than \$1 billion a year on fuel—or “feedstocks,” in industry parlance—for its six Louisiana plants, said Shipp, who heads the company’s operations in the state and in Texas. Chemical manufacturing requires extreme heat and other processes that consume vast

amounts of natural gas, oil, oil byproducts, and other fuels. Dow Chemical also generates some of its own energy.

“The impact of shale gas and low-cost energy is a big deal for the chemical industry and for Dow,” Shipp said.

Inexpensive natural gas is prompting Dow to reopen a plant it shuttered two years ago in St. Charles Parish near New Orleans, a move that will put 800 people back to work.

Dow was purchasing natural gas in the spring at a price more than two-thirds lower than it paid in 2000 and 2001. Prices are even lower in the Persian Gulf region, but shipping costs make U.S. gas a better bargain, Shipp noted.

Low natural gas prices have spurred a number of Louisiana expansion announcements from petrochemical makers, Dismukes said. In addition to Dow’s plans, Sasol Ltd., a South African manufacturer, last September announced plans to build a plant in Calcasieu Parish to convert natural gas into diesel fuel. The project could cost up to \$10 billion, the company says. Sasol is also studying the feasibility of investing an additional \$3.5 billion to \$4.5 billion in its existing Lake Charles site to produce a natural gas derivative used to make ethylene, an ingredient in numerous polymers and plastics.

Louisiana’s energy sector has helped the state economy outpace the other five southeastern states since 2007, based on an index of economic activity developed by the Federal Reserve Bank of Philadelphia. It should also be noted that Louisiana experienced a less severe downturn than other southeastern states and the country as a whole. The recession claimed 8.5 percent of jobs in the Southeast, and 6.4 percent nationwide. Louisiana employment dipped 4 percent. In the subsequent recovery, regional and national employment increased 2.5 percent and 2.8 percent, respectively, through March. Meanwhile, Louisiana employment has climbed 4.2 percent, according to the BLS and the Atlanta Fed.

### **Louisiana unique in the Southeast**

Louisiana is unquestionably the energy hub of the Southeast. The state boasts 57,400 jobs in the mining and logging category, virtually all of them in oil and gas extraction, the BLS says—more mining and logging employment than in the other five southeastern states combined.

Louisiana ranked third among states in total energy production in 2009, according to the latest data from the EIA. Only one other southeastern state, Alabama, ranked among the top 28 energy producers. For January 2012, Louisiana ranked seventh in crude oil production, down from fourth in 2009 and fifth in 2010, by EIA data. That slight dip in the rankings reflects increased production in some other states, such as North Dakota, and the decline in Louisiana production. The state was third in natural gas output, behind Texas and Alaska.

Another statistic illustrates just how significant energy is to Louisiana’s economy. The four economic sectors most rooted in



oil and gas production—oil and gas extraction, petroleum and coal product manufacturing, support services for mining, and chemical manufacturing—account for 24 percent of the state’s economic activity, according to 2009 data, the most recent available from the U.S. Bureau of Economic Analysis. That’s six times the proportion of the U.S. gross domestic product accounted for by those industries. By this measure, only Alaska and Wyoming are as dependent on energy as Louisiana. (Texas produces more energy than any state but has such a large economy that energy makes up a smaller share of total activity.)

Energy is not all of Louisiana’s economy, certainly. But it is obviously vital, and more diverse than one might assume. As the nation experiences an energy renaissance, the Southeast’s energy hub finds its own reality to be a complex roux of economic effects. ■

*This article was written by Charles Davidson, a staff writer for EconSouth.*