2013 STATE OIL AND GAS: PRODUCTION AND PRICE PROJECTIONS

by
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Louisiana has produced oil and gas for more than a century. Oil and gas production are intimately linked with the economy of our state. Presently, Louisiana is the seventh largest producer of crude oil and the second largest producer of natural gas in the U.S., if the federal Outer Continental Shelf (OCS) production is excluded. Louisiana is also third in per capita energy consumption. More than 230,000 wells have been drilled searching for oil and gas in Louisiana since the first commercial oil well was drilled in 1901 in Jennings. The Louisiana OCS oil and gas production volumes are greater than in any other federally regulated offshore areas in the U.S.

Here are other interesting benchmarks in the Louisiana oil and gas production history. In 1910, the first freestanding above-water platform was used in Caddo Lake, near Shreveport. In 1938, the first well over water was completed in the Gulf of Mexico near Creole, offshore Cameron Parish. In 1947, the first offshore oil well was completed out of sight from land in Ship Shoal Block 32 (south of Morgan City, Saint Mary Parish). In 1951, the first concrete-coated pipeline was laid in the Gulf of Mexico. In 1954, the state started to produce more natural gas in terms of barrels of oil equivalents than crude oil. In 2006, Haynesville Shale gas started producing, making the gas domination in the state more predominant and, in 2010, oil production slowly started to reverse its declining trend due to production from oil shale formations and enhanced recovery in mature fields.

Production Projections

Table 1. Louisiana Historical and Projected Crude Oil Productions

	Date	Base Case (Barrels)	% Change	Low Case (Barrels)	High Case (Barrels)
Actual	FY2005/06	68,871,900	-17.57%	N/A	N/A
Actual	FY2006/07	76,896,150	11.65%	N/A	N/A
Actual	FY2007/08	77,057,382	0.21%	N/A	N/A
Actual	FY2008/09	68,790,278	-10.73%	N/A	N/A
Actual	FY2009/10	67,490,924	-1.89%	N/A	N/A
Actual	FY2010/11	68,929,452	2.13%	N/A	N/A
Actual	FY2011/12	73,565,493	6.73%	N/A	N/A
Projected	FY2012/13	74,993,393	1.94%	71,038,005	76,035,065
Projected	FY2013/14	75,099,784	0.14%	71,739,321	79,354,326
Projected	FY2014/15	74,575,483	-0.70%	70,701,138	79,796,412
Projected	FY2015/16	74,082,476	-0.66%	69,640,592	80,048,161
Projected	FY2016/17	73,617,923	-0.63%	68,615,830	79,768,222

The Louisiana state oil production, excluding federal OCS, showed an average decline of 2.8% per year over the past ten years, but actual year-to-year change varies widely, as shown in the above table. Hurricanes Katrina and Rita caused a 17.57% decline in oil production in FY2005/06; the recovery from the weather disaster and rising oil prices caused increases in production volumes in FY2006/07 and FY2007/08. Hurricanes Gustav and Ike caused a 9.83% decline in FY2008/09. A plunge in oil prices in

FY2009/10 delayed production recovery from weather disasters. The delayed recovery and new production from enhanced oil recovery in old oil fields caused production to increase in FY2010/11. Continuous production from enhanced oil recovery fields, new production from oil shale formations, and relatively high oil prices caused production to increase in FY2011/12. The Department of Natural Resources (DNR) Technology Assessment Division short-term model is projecting a stable oil production over the next five years, if crude oil prices stay around $90 per barrel and no major weather disruptions occur. The above table lists the projections for the next five years. If prices go over $100 for an extended period, the projections will be closer to the high case, and if the Tuscaloosa Marine shale or the Brown Dense shale productions take off, the above oil production projections will be too conservative.

Table 2. Louisiana Historical and Projected Natural Gas Productions

	Date	Base Case (MCF)	% Change	Low Case (MCF)	High Case (MCF)
Actual	FY2005/06	1,282,110,642	-5.40%	N/A	N/A
Actual	FY2006/07	1,353,183,804	5.54%	N/A	N/A
Actual	FY2007/08	1,373,047,374	1.47%	N/A	N/A
Actual	FY2008/09	1,380,586,101	0.55%	N/A	N/A
Actual	FY2009/10	1,794,557,505	29.99%	N/A	N/A
Actual	FY2010/11	2,598,251,017	44.79%	N/A	N/A
Actual	FY2011/12	3,078,712,748	18.49%	N/A	N/A
Projected	FY2012/13	3,171,378,911	3.01%	2,961,270,725	3,282,416,102
Projected	FY2013/14	3,148,742,912	-0.71%	2,924,117,809	3,408,550,556
Projected	FY2014/15	3,121,124,388	-0.88%	2,886,290,489	3,388,121,452
Projected	FY2015/16	3,094,334,771	-0.86%	2,850,725,629	3,369,916,936
Projected	FY2016/17	3,067,947,745	-0.85%	2,815,676,386	3,351,916,282

Louisiana state gas production, excluding federal OCS, from FY2001/02 thru FY2006/07 declined an average of 1.55% per year. Similar to oil, gas production varies from year-to-year, reflecting the severity of weather patterns. In FY2006/07, the Haynesville Shale dry gas field came into the picture and changed the pattern. For example, the high decline in oil production in FY2008/09 was due to Hurricanes Gustav and Ike, while gas production showed a slight increase. If there had been no hurricanes that year, the percentage of increase in production would have been higher. From FY2008/09 through FY2011/12, Louisiana state gas production has shown percent increases in the double digits. The DNR Technology Assessment Division short-term model projections for the next five years are shown in the above table. The projections assume that no major weather disruptions occur and average gas prices are above $3 per MCF. The 2012 gas prices dropping below $3 per MCF have caused a slowdown in drilling activities in the Haynesville Shale areas. In January 2012, there were 93 active rigs in Haynesville areas, and in January 2013, there were 16 active rigs, an 82.8% decline. The drop in drilling activities, cutback in production due to low prices, and overstock of gas in storage will curtail the gas production growth in Louisiana.

Factors that contribute to the year-to-year deviations in oil and gas production are:

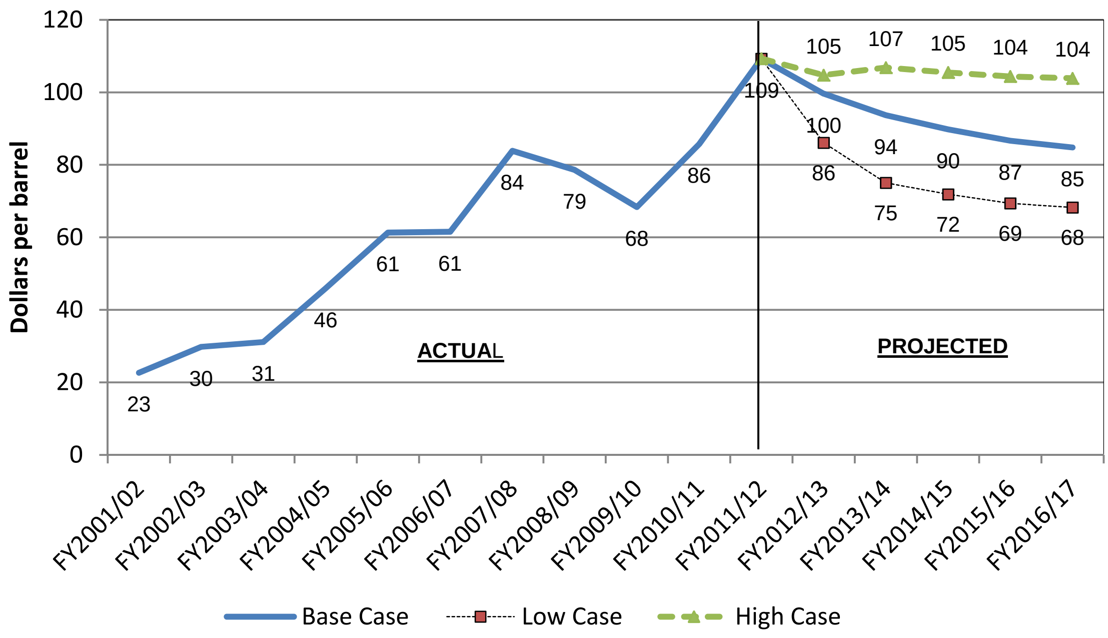
- Changes in wildcat drilling and development of marginal fields within the state,
- adding new producing areas,
- unstable crude oil and natural gas prices,

- changes in environmental laws, especially those concerning salt water discharge and the Clean Air Act Amendments of 1990,
- world supply and demand causing a glut or shortage, depending on its growth rate,
- the number of active drilling rigs in the region,
- application of advanced technology, such as 3-D, 4D, or carbon dioxide injection,
- state and local tax incentives,
- weather patterns,
- foreign imports or exports.

Price Projections

Oil prices are determined in the international markets and are difficult to project. Just as the historical data shows great swings in the price of oil, there is also considerable uncertainty about future prices. The future price of oil is linked to the unpredictability of world oil supplies and world economics. Major factors affecting oil prices are a) political stability of producing countries, b) world environmental issues, c) industrialized countries' conservation practices, d) weather related demand for petroleum products, e) production restrictions by OPEC countries, f) economic changes in consumer nations, g) stability in the labor force, and h) new producing fields. If crude oil supply and demand for petroleum products are well balanced and refiners have sufficient downstream capacity to process difficult crudes, the price of crude oil will seek a stable market condition.

Figure 1. Louisiana Crude Oil Historical and Projected Prices

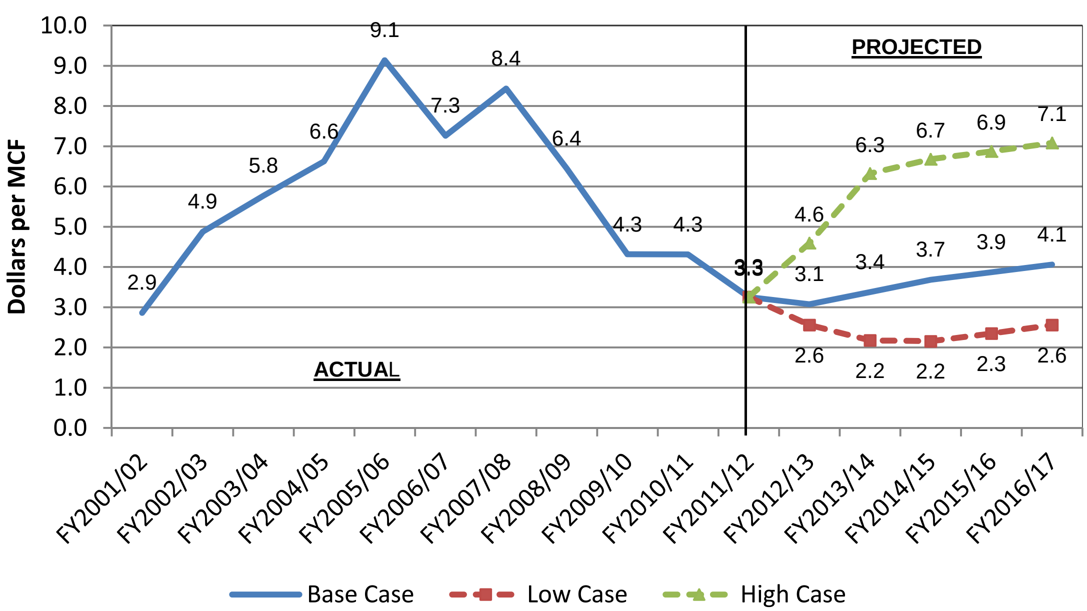


Louisiana crude oil price is over $100 per barrel in the spot market at the present. It is expected to drop when crude transportation issues from Cushing, OK to the Gulf Coast refineries are solved, more production from shale formations enter the market, production increases from old fields using enhanced techniques, and the economy keeps its slow recovery pace.

The most used relationship between crude oil price and natural gas price is the so-called "6-to-1" rule, where the price of one barrel of crude oil should be approximately six times the price of natural gas per million BTUs (MMBTUs). The reason is that the BTU content of a barrel of oil is around six times the quantity of a million BTUs of natural gas. Natural gas prices recently started to diverge from this relationship, with the current ratio being 58:1. Oil prices have risen rapidly while gas prices are falling, because Asian countries are consuming more oil than gas as they recover from recent recession and the earthquake in Japan, and the political unrest in African and Islamic countries are disrupting oil supply more heavily than gas supply. Gas has less mobility than oil in international trade because it requires special vessels and infrastructure (pipelines, compression stations, LNG terminals, etc.). Gas prices are cyclical, regional, controlled by supply and demand, and lack infrastructure for international trade. They are driven by factors such as weather, demand for gas not satisfied by pipeline systems, availability of spot supplies, and competing fuel prices. Others factors that could affect prices are storage levels, curtailments, market changes, new consumption, and NAFTA (North American Free Trade Agreement). Gas prices are also affected by psychological factors. Often the expectation of soft prices is enough to bring them about and a good dose of cold winter weather will usually erase much of the psychological element of low gas prices, and prices will move higher.

The lack of mobility of natural gas between producing areas and consuming areas caused by insufficient infrastructure is best shown by the Federal Energy Regulatory Commission's March 2013 world LNG estimated landed prices. Gas prices are $19.75 per MMBTU in Japan, $17.75 per MMBTU in Korea, $15.70 per MMBTU in India, $9.86 per MMBTU in Belgium, $15.25 per MMBTU in Spain, $16.84 per MMBTU in Brazil, and $3.01 per MMBTU in the U.S. (Lake Charles). The low price in the U.S. is caused by the over supply of gas from shale plays.

Figure 2. Louisiana Natural Gas Historical and Projected Prices



Louisiana gas prices are expected to be around $3 per MMBTU in the near future, and to increase to $4 or more per MMBTU when demand increases from newly built plants in the state and LNG export terminals became operational.