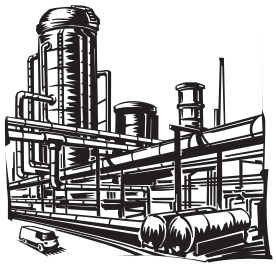
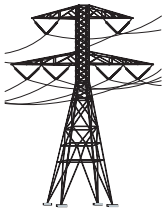
LOUISIANA ENERGY FACTS ANNUAL





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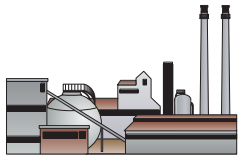

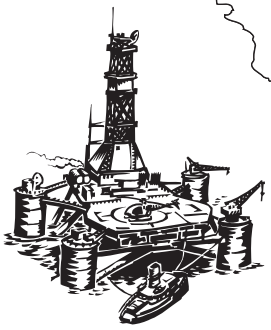

DEPARTMENT OF NATURAL RESOURCES
Technology Assessment Division
March 31, 2018

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LOUISIANA ENERGY FACTS

ANNUAL 2017

Department of Natural Resources
Thomas Harris
Secretary of Natural Resources

Prepared by
Edward L. O'Brien, III,
Senior Economist

Technology Assessment Division

P.O. Box 94396
Baton Rouge, LA 70804-9396
E-mail: TECHASMT@la.gov
WEB: www.dnr.louisiana.gov/tad

March 31, 2018

General Questions and Comments

The **Louisiana Energy Facts Annual - 2017** (**Annual**) was published by the Technology Assessment Division of the Louisiana Department of Natural Resources under the direction of Edward O'Brien. The division director is Paul D. Miller.

General questions and comments regarding the **Annual** may be referred to Technology Assessment Division staff at (225) 342-1270. Questions concerning specific areas of the **Annual** may be directed to the Technology Assessment Division staff members listed below.

Oil & gas production, drilling, revenue, reserves, prices, electric utilities, coal and lignite, and general energy statistics:

Edward O'Brien.
Senior Economist
(225) 342-8573
E-mail: Edward.OBrien@la.gov

Additional copies of this document may be obtained by contacting:

Department of Natural Resources
Technology Assessment Division
P.O. Box 94396
Baton Rouge, LA 70804-9396
Phone: (225) 342-1270 FAX: (225) 342-1397
E-mail: TECHASMT@la.gov
Web: www.dnr.louisiana.gov/tad

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INTRODUCTION

ABOUT THIS PUBLICATION

The **Louisiana Energy Facts Annual** (**Annual**) is published to provide a comprehensive compendium of Louisiana related energy production and use statistics on a yearly basis. The data tables are supplemented with numerous graphs and charts to aid in the interpretation of the data and the discernment of trends. The **Annual** is published as soon as sufficient data for the previous calendar year is available. Due to time lags in the availability of some of the data, there is approximately a six month lag before the current **Annual** can be published. Some changes have been introduced in order to incorporate the latest available data.

If you read our monthly **Louisiana Energy Facts** newsletter, you may find that some of the previously published data has been revised in the **Annual**. This data, by its nature, continues to be revised, sometimes years after the initial publication. We try to bring attention to these changes by marking them as revisions.

The most recent **Louisiana Energy Facts** monthly newsletter may contain even more updates. Please refer to the recent monthly newsletters for the very latest data. The **Louisiana Energy Facts** monthly newsletter is available online at our website:

http://www.dnr.louisiana.gov/tad

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  Facts & Figures

Note: the data in these tables will be updated throughout the year. The data files are not audited and will change as more reliable data becomes available.

The Technology Assessment Division is not the source of the data, but merely reports data provided to us by the responsible agency. We understand that users of our time series data need consistency and, for that reason, our time series have been adjusted backward to reflect these new modifications.

Additional comments or suggestions about this publication can be directed to the Technology Assessment Division staff members listed on the General Questions and Comments page.

We hope you find this document useful, and we appreciate your feedback. Please fill in, detach and return the survey form at the back of this report.

2017 HIGHLIGHTS

The data in the 2017 **Louisiana Energy Facts Annual** contains some recent trends.

Crude Oil and Natural Gas Prices

Gas spot price average was $2.49 per MCF in 2016, and it was $3.02 per MCF in 2017; which is 21.2% higher than in 2016. The Louisiana natural gas spot market average in January 2017 was $3.51 per MCF and fell to $2.78 per MCF in December 2017. The January price was attributed to a colder than normal weather pattern and the price decrease at the end of 2017 was caused by increased storage and greater production. The average price for gas for 2018 is expected to be around $3.00 per MCF.

Light Louisiana Sweet (LLS) average spot crude oil price was $44.86 per barrel in 2016 and it was $54.10 per barrel in 2017, a 20.6% increase. The LLS crude oil spot price average was $54.04 per barrel in January 2017 and rose to $62.75 per barrel in December 2017. The oil price increase was caused by OPEC cutting production, a gradually weaker dollar, and declining volumes in storage. The 2018 LLS average spot price is expected to be above $60 per barrel.

Oil and Gas Production

Louisiana state oil production was lower in 2017 than in 2016, and the same holds true for the federal Outer Continental Shelf (OCS) in the Gulf of Mexico (GOM). The Louisiana state crude oil and condensate production, excluding the federal OCS, was 56.6 million barrels (MMB) in 2016 and it was 52.2 MMB in 2017. The 2017 oil production was 4.4 MMB or 7.7% lower than 2016. The preliminary Central GOM oil production in 2017 is 594.5 MMB and it was 42.8 MMB or 7.8% higher than 2016 oil production. The increase in Central GOM oil was higher overall oil prices compared to the previous year.

Louisiana gas production was higher in 2017 than in 2016. The Louisiana state natural gas and casinghead, excluding OCS production, was 1.86 TCF in 2017, 11.1% higher than 2016. The increase in gas was driven by higher gas prices and an increase in drilling in the Haynesville shale area, and higher production from other shale plays that are capable of producing hydrocarbons liquids.

The Haynesville shale is producing around 60% of the state total gas production. The preliminary Central GOM gas production in 2017 is 1.01 TCF, decreasing in production in 2016 by 8.0%. The Central GOM gas production has decreased due to shifting priorities from gas fields to oil fields.

SUBDIVISIONS OF LOUISIANA

Drilling

Louisiana rig count, including the OCS area, averaged 61 active rigs in 2017, 30.0% lower than in 2016. In state areas, state offshore region drilling rigs was almost non-existent in 2017, South LA Inland water maintained the same in 2017 as it did in2016, South LA inland land showed 2 drilling rigs decrease in 2017, North LA region showed 19 drilling rigs decrease in 2017, and LA Federal OCS average showed a 2 drilling rigs decrease in 2017 from 2016. One of the main reasons for the increase in drilling was the rejuvenation of Haynesville play.

Other significant items

Louisiana refineries 2017 daily crude oil average runs to stills were 3.03 million barrels per day, increasing 2016 daily production by 2.3%.

Average employment in the oil and gas extraction industries was 34,329 in 2016; a 21.07% decrease from 2015, due to a decrease in exploration and production activities.

Louisiana proved oil reserves were lower in 2016 than in 2015, due to decreases in the Fed OCS and the North and State Onshore regions, while state onshore showed a slight increase. The decrease in oil reserve was due to reservoir adjustments in accordance as a reflection on recoverable resources. Louisiana proved gas reserves were higher in 2016 than in 2015 in all Louisiana regions with the exception of the state onshore region and OCS reflecting modest gains. The increase in gas reserves were the result of steady gas drilling activities in these Louisiana regions and discovering more supply, and the state onshore and OCS regions natural gas reserve decline was due to lack of drilling activities.

Table 1

LOUISIANA STATE CRUDE OIL PRODUCTION

Excluding OCS
(Barrels)

DATE	NORTH	SOUTH	OFFSHORE	TOTAL
1997	17,254,666	63,980,263	13,537,822	94,772,751
1998	16,320,254	62,329,107	12,731,270	91,380,631
1999	13,024,727	56,492,360	11,507,149	81,024,236
2000	11,890,407	53,957,823	10,120,547	75,968,777
2001	10,835,037	50,906,438	9,293,584	71,035,059
2002	9,734,754	43,151,661	7,630,661	60,517,076
2003	9,179,787	41,803,886	8,453,966	59,437,639
2004	8,697,903	41,289,067	7,015,580	57,002,550
2005	8,585,924	36,628,208	5,587,547	50,801,679
2006	8,327,465	36,416,376	4,639,216	49,383,057
2007	8,091,774	39,053,879	5,480,658	52,626,311
2008	8,010,562	36,313,404	4,124,198	48,448,164
2009	7,955,097	35,621,149	3,858,277	47,434,523
2010	7,915,495	36,270,826	4,671,151	48,857,472
2011	9,136,216	37,563,060	5,064,106	51,763,382
2012	9,961,475	39,816,038	5,036,472	54,813,985
2013	10,478,346	40,421,255	5,584,262	56,483,863
2014	10,093,552	39,265,997	5,551,263	54,910,812
2015	9,722,891 r	35,478,795 r	5,246,298 r	50,447,984 r
January	785,558 r	2,637,015 r	386,841 r	3,809,414 r
February	732,582 r	2,568,676 r	415,171 r	3,716,429 r
March	737,265 r	2,787,714 r	431,804 r	3,956,783 r
April	718,647 r	2,725,998 r	420,055 r	3,864,700 r
May	759,578 r	2,775,269 r	453,478 r	3,988,325 r
June	756,010 r	2,623,127 r	439,517 r	3,818,654 r
July	780,000 r	2,667,043 r	428,276 r	3,875,319 r
August	779,220 r	2,562,205 r	424,756 r	3,766,181 r
September	757,085 r	2,621,095 r	398,111 r	3,776,291 r
October	781,482 r	2,686,547 r	403,083 r	3,871,112 r
November	763,761 r	2,448,064 r	368,247 r	3,580,072 r
December	801,918 r	2,426,471 r	382,763 r	3,611,152 r
2016 Total	**9,153,106 r**	**31,529,224 r**	**4,952,102 r**	**45,634,432 r**
January	785,144	2,408,477	375,257	3,568,878
February	736,561	2,199,709	322,332	3,258,602
March	797,235	2,432,084	325,804	3,555,123
April	768,261	2,394,263	344,523	3,507,047
May	791,565	2,405,503	342,298	3,539,366
June	753,246	2,254,687	325,232	3,333,165
July	771,698	2,369,786	330,987	3,472,471
August	748,309	2,297,049	317,520	3,362,878
September	760,483	2,316,127	325,470	3,402,079
October	758,940 p	2,300,687 p	321,735 p	3,381,362 p
November	752,467 p	2,279,975 p	317,705 p	3,350,147 p
December	752,312 p	2,284,972 p	316,230 p	3,353,514 p
2017 Total	**9,176,221 p**	**27,943,318 p**	**3,965,093 p**	**41,084,632 p**

e Estimated r Revised p Preliminary See footnote in Appendix B

Table 2

LOUISIANA STATE CONDENSATE PRODUCTION

Excluding OCS
(Barrels)

DATE	NORTH	SOUTH	OFFSHORE	TOTAL
1997	4,397,384	24,247,395	2,737,982	31,382,763
1998	3,962,756	24,405,878	2,400,173	30,760,168
1999	3,555,355	24,032,940	2,233,271	29,798,463
2000	3,417,173	26,347,208	1,429,439	31,193,588
2001	3,352,988	28,003,761	1,933,594	33,831,960
2002	2,926,737	27,980,334	1,761,536	33,173,039
2003	2,789,398	25,616,633	1,850,882	30,936,684
2004	2,926,460	21,468,353	1,684,363	26,689,554
2005	3,323,446	20,365,449	1,195,413	24,884,308
2006	3,773,415	18,735,542	2,078,103	24,587,060
2007	4,335,873	18,299,586	2,114,728	24,750,187
2008	5,107,407	16,897,961	2,157,717	24,163,085
2009	4,254,544	15,004,194	2,131,896	21,390,634
2010	3,269,391	13,240,103	1,911,052	18,420,546
2011	3,148,207	12,601,089	1,452,156	17,201,452
2012	2,797,876	11,878,591	1,559,822	16,236,289
2013	3,203,023	11,356,408	1,186,810	15,746,241
2014	3,377,301	9,989,651	787,171	14,154,123
2015	3,065,275 r	9,016,891 r	586,438	12,668,604 r
January	281,045 r	724,755 r	38,180 r	1,043,980 r
February	255,508 r	657,920 r	39,301 r	952,729 r
March	304,571 r	689,665 r	37,266 r	1,031,502 r
April	304,702 r	644,091 r	32,849 r	981,642 r
May	268,471 r	641,494 r	30,413 r	940,378 r
June	227,369 r	599,123 r	29,637 r	856,129 r
July	263,327 r	610,452 r	35,058 r	908,837 r
August	205,283 r	619,232 r	26,421 r	850,936 r
September	247,473 r	586,560 r	26,624 r	860,657 r
October	269,382 r	600,429 r	27,474 r	897,285 r
November	208,998 r	579,654 r	24,885 r	813,537 r
December	251,528 r	580,570 r	28,404 r	860,502 r
2016 Total	**3,087,657 r**	**7,533,945 r**	**376,512 r**	**10,998,114 r**
January	427,376	555,843	23,706	1,006,925
February	298,169	532,191	21,224	851,584
March	330,951	599,382	23,200	953,533
April	399,019	576,847	39,159	1,015,025
May	313,184	602,448	25,626	941,258
June	317,661	555,193	24,891	897,745
July	267,565	577,073	23,494	868,132
August	337,676	581,744	25,409	944,829
September	322,116	571,138	26,690	919,944
October	306,966 p	570,012 p	24,289 p	901,266 p
November	305,741 p	563,609 p	24,031 p	893,381 p
December	303,392 p	565,270 p	23,866 p	892,528 p
2017 Total	**3,929,816 p**	**6,850,749 p**	**305,585 p**	**11,086,150 p**

e Estimated r Revised p Preliminary See footnote in Appendix B

Table 3

LOUISIANA STATE CRUDE OIL and CONDENSATE PRODUCTION

Excluding OCS
(Barrels)

DATE	NORTH	SOUTH	OFFSHORE	TOTAL
1997	21,829,276	88,295,426	16,030,812	126,155,514
1998	20,304,949	87,523,706	14,312,144	122,140,799
1999	16,711,501	81,260,610	12,850,588	110,822,699
2000	15,307,562	80,304,828	11,549,975	107,162,365
2001	14,274,475	79,328,486	11,264,058	104,867,019
2002	12,726,261	71,523,765	9,440,089	93,690,115
2003	12,049,211	67,975,624	10,349,488	90,374,323
2004	11,696,648	63,270,406	8,725,050	83,692,104
2005	11,909,370	56,993,657	6,782,960	75,685,987
2006	12,100,880	55,151,918	6,717,319	73,970,117
2007	12,427,647	57,353,465	7,595,386	77,376,498
2008	13,117,969	53,211,365	6,281,915	72,611,249
2009	12,209,641	50,625,343	5,990,173	68,825,157
2010	11,184,886	49,510,929	6,582,203	67,278,018
2011	12,284,423	50,164,149	6,516,262	68,964,834
2012	12,759,351	51,694,629	6,596,294	71,050,274
2013	13,681,369	51,777,663	6,771,072	72,230,104
2014	13,470,853	49,255,648	6,338,434	69,064,935
2015	12,788,166 r	44,495,686 r	5,832,736 r	63,116,588 r
January	1,066,603 r	3,361,770 r	425,021	4,853,394 r
February	988,090 r	3,226,596 r	454,472	4,669,158 r
March	1,041,836 r	3,477,379 r	469,070	4,988,285 r
April	1,023,349 r	3,370,089 r	452,904 r	4,846,342 r
May	1,028,049 r	3,416,763 r	483,891	4,928,703 r
June	983,379 r	3,222,250 r	469,154 r	4,674,783 r
July	1,043,327 r	3,277,495 r	463,334	4,784,156 r
August	984,503 r	3,181,437 r	451,177	4,617,117 r
September	1,004,558 r	3,207,655 r	424,735	4,636,948 r
October	1,050,864 r	3,286,976 r	430,557 r	4,768,397 r
November	972,759 r	3,027,718 r	393,132 r	4,393,609 r
December	1,053,446 r	3,007,041 r	411,167 r	4,471,654 r
2016 Total	**12,240,763 r**	**39,063,169 r**	**5,328,614 r**	**56,632,546 r**
January	1,212,520	2,964,320	398,963	4,575,803
February	1,034,730	2,731,900	343,556	4,110,186
March	1,128,186	3,031,466	349,004	4,508,656
April	1,167,280	2,971,110	383,682	4,522,072
May	1,104,749	3,007,951	367,924	4,480,624
June	1,070,907	2,809,880	350,123	4,230,910
July	1,039,263	2,946,859	354,481	4,340,603
August	1,085,985	2,878,793	342,929	4,307,707
September	1,082,599	2,887,265	352,160	4,322,024
October	1,065,905 p	2,870,698 p	346,024 p	4,282,628 p
November	1,058,208 p	2,843,584 p	341,736 p	4,243,528 p
December	1,055,705 p	2,850,242 p	340,095 p	4,246,042 p
2017 Total	**13,106,036 p**	**34,794,068 p**	**4,270,678 p**	**52,170,782 p**

e Estimated r Revised p Preliminary See footnote in Appendix B

Figure 1

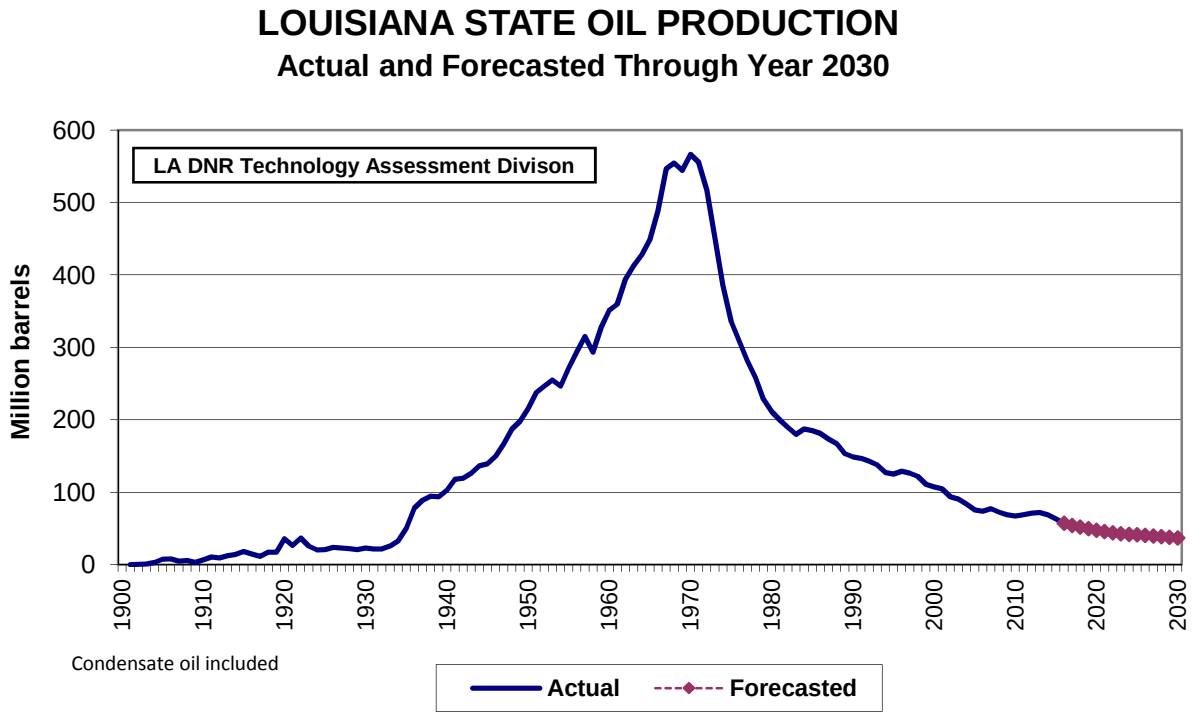
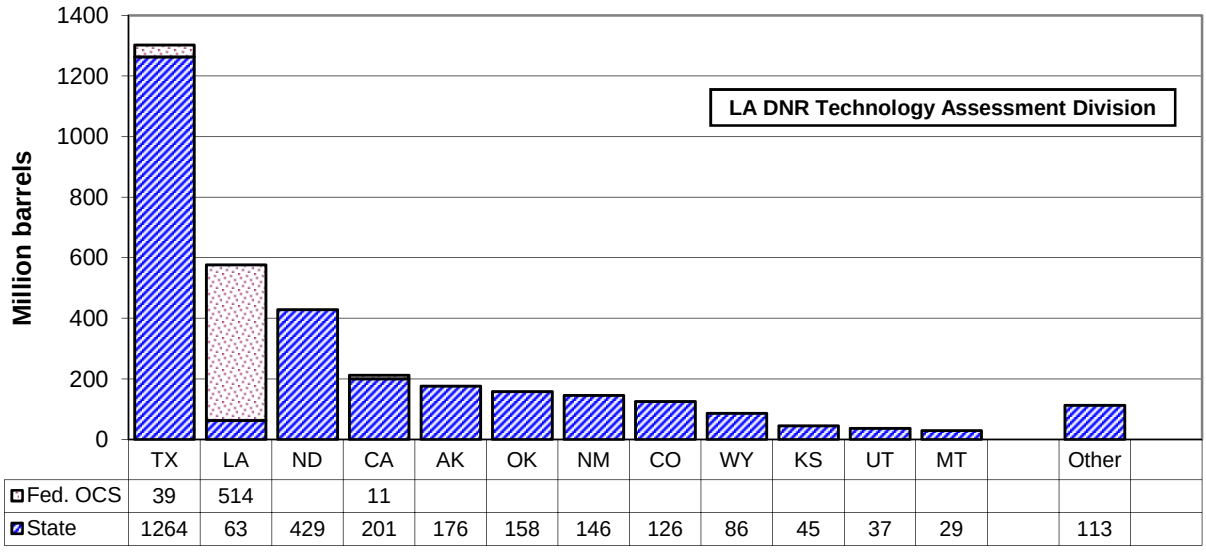


Figure 2



Federal OCS production estimated

Table 4

LOUISIANA and GOM CENTRAL CRUDE OIL and CONDENSATE PRODUCTION

(Barrels)

DATE	ONSHORE	OFFSHORE		TOTAL
		State	GOM Central	
1997	110,124,702	16,030,812	389,573,523	515,729,037
1998	107,828,655	14,312,144	419,841,427	541,982,226
1999	97,972,111	12,850,588	474,461,887	585,284,586
2000	95,612,390	11,549,975	500,407,261	607,569,626
2001	93,602,961	11,264,058	524,563,398	629,430,417
2002	84,250,026	9,440,089	521,432,474	615,122,589
2003	80,024,835	10,349,488	509,552,915	599,927,238
2004	74,967,054	8,725,050	482,598,762	566,290,866
2005	68,903,027	6,782,960	418,763,978	494,449,965
2006	67,252,798	6,717,319	431,633,489	505,603,606
2007	69,781,112	7,595,386	435,264,843	512,641,341
2008	66,329,334	6,281,915	396,112,395	468,723,644
2009	62,834,984	5,990,173	544,854,279	613,679,436
2010	60,695,815	6,582,203	541,600,736	608,878,754
2011	62,448,572	6,516,262	451,838,190	520,803,024
2012	64,453,980	6,596,294	422,692,750	493,743,024
2013	65,459,032	6,771,072	415,760,908	487,991,012
2014	62,726,501	6,338,434	470,176,016	539,240,951
2015	57,283,852	5,832,736	514,348,509	577,465,097
January	4,428,373 r	425,021	46,487,631 r	51,341,025 r
February	4,214,686 r	454,472	42,438,160 r	47,107,318 r
March	4,519,215 r	469,070	47,196,495 r	52,184,780 r
April	4,393,438 r	452,904 r	44,828,400 r	49,674,742 r
May	4,444,812 r	483,891	46,677,999 r	51,606,702 r
June	4,205,629 r	469,154 r	43,717,397 r	48,392,180 r
July	4,320,822 r	463,334	45,936,348 r	50,720,504 r
August	4,165,940 r	451,177	47,377,130 r	51,994,247 r
September	4,212,213 r	424,735	42,322,086 r	46,959,034 r
October	4,337,840 r	430,557 r	47,171,139 r	51,939,536 r
November	4,000,477 r	393,132 r	47,353,869 r	51,747,478 r
December	4,060,487 r	411,167 r	50,209,054 r	54,680,708 r
2016 Total	**51,303,932 r**	**5,328,614**	**551,715,708 r**	**608,348,254 r**
January	4,176,840	398,963	51,087,224	55,663,027
February	3,766,630	343,556	46,474,956	50,585,142
March	4,159,652	349,004	52,661,532	57,170,188
April	4,138,390	383,682	48,936,277	53,458,349
May	4,112,700	367,924	49,269,492	53,750,116
June	3,880,787	350,123	46,006,311	50,237,221
July	3,986,122	354,481	51,187,659	55,528,262
August	3,964,778	342,929	49,535,086	53,842,793
September	3,969,863	352,160	42,980,924	47,302,948
October	3,936,604 p	346,024 p	50,944,830 p	4,282,628 p
November	3,901,791 p	341,736 p	51,142,179 p	4,243,528 p
December	3,905,946 p	340,095 p	54,225,778 p	4,246,042 p
2017 Total	**47,900,104 p**	**4,270,678 p**	**594,452,248 p**	**490,310,243 p**

e Estimated r Revised p Preliminary See footnote in Appendix B

Figure 3

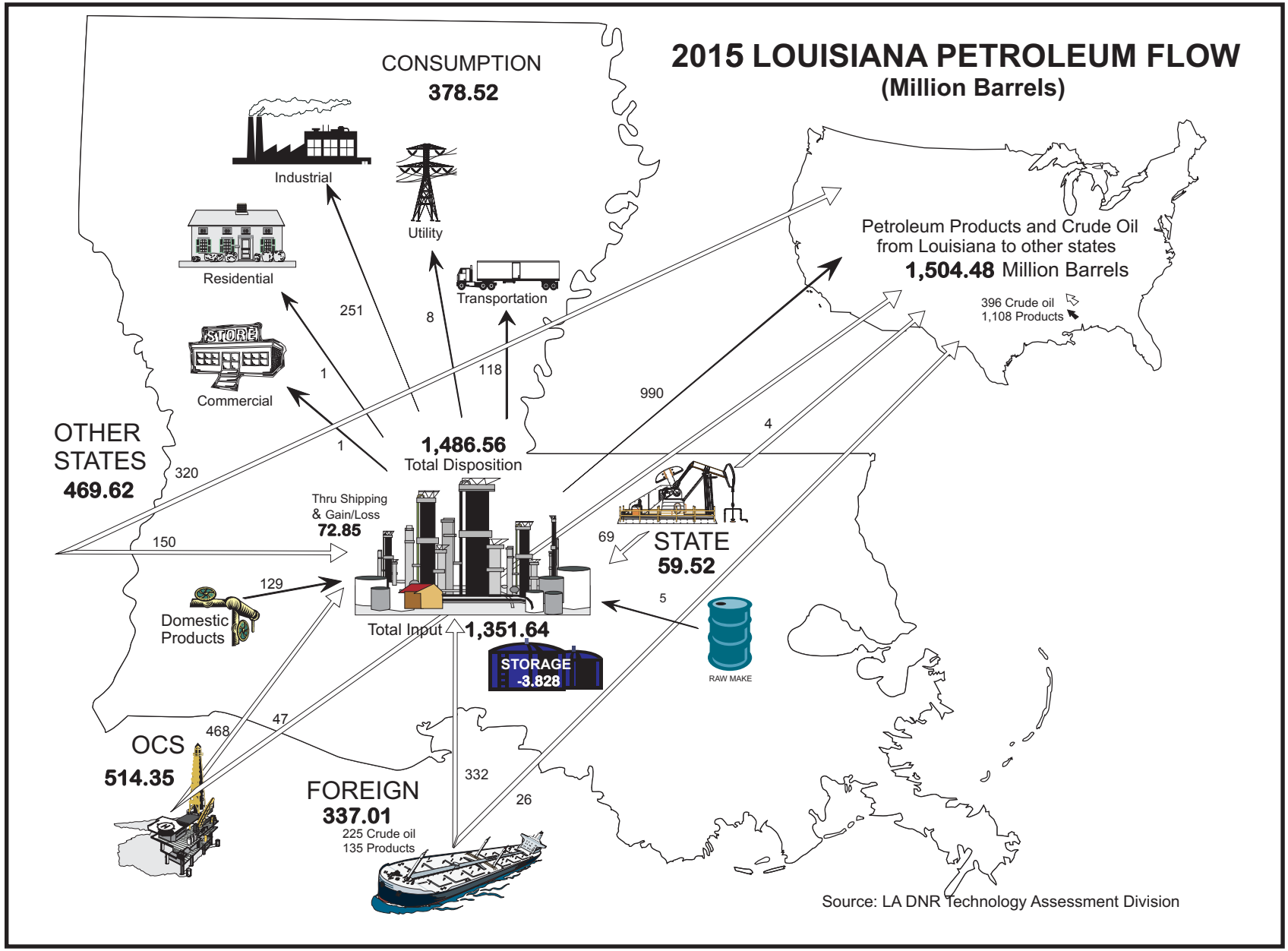

2015 LOUISIANA PETROLEUM FLOW
(Million Barrels)
CONSUMPTION
378.52
Industrial
Utility
Residential
Transportation
Commercial
STORE
251
8
1
118
990
4
1
320
150
129
69
5
OTHER STATES
469.62
1,486.56
Total Disposition
Thru Shipping & Gain/Loss
72.85
STATE
59.52
Domestic Products
Total Input
1,351.64
STORAGE
-3.828
RAW MAKE
Petroleum Products and Crude Oil from Louisiana to other states
1,504.48 Million Barrels
396 Crude oil
1,108 Products
468
47
OCS
514.35
332
26
FOREIGN
337.01
225 Crude oil
135 Products
Source: LA DNR Technology Assessment Division

Table 5

LOUISIANA STATE OIL PRODUCTION* BY TAX RATES AS PUBLISHED IN SEVERANCE TAX REPORTS[8] (Barrels)

DATE	FULL RATE	INCAPABLE WELLS RATE	STRIPPER WELLS RATE	TAXED VOLUME
1997	101,772,533	3,466,389	6,101,247 e	111,340,169 e
1998	89,083,365	2,878,225	5,892,007 e	97,853,597 e
1999	85,207,438	2,786,515	5,690,984 e	93,684,937 e
2000	88,411,207	2,783,268	5,322,515	96,516,990 e
2001	83,994,058	2,576,683	5,175,142	91,745,883
2002	79,038,703 e	2,571,901 e	4,681,607 e	86,292,211
2003	75,070,785	2,565,017	4,912,890	82,548,691 e
2004	73,133,821	2,852,851	4,838,681	80,825,353
2005	61,356,971	2,754,911	4,784,530	68,896,412
2006	61,520,365	2,621,592	4,786,820	68,928,778
2007	64,036,607	2,612,497	4,531,456	71,180,560
2008	61,520,109	2,564,615	4,974,961	69,059,684
2009	55,212,475	1,927,478	4,364,995	61,504,949
2010	52,998,554	2,144,740	4,315,681	59,458,975
2011	51,052,360	2,360,106	4,764,525	58,176,991
2012	52,052,999	2,319,256	5,117,590	59,489,845
2013	54,720,459	2,110,666	5,117,677	61,948,801
2014	50,583,025	2,021,531	4,565,344	57,169,900
2015	48,969,890	2,049,703	5,042,452	56,062,045
January	4,190,131	170,514	372,316	4,732,962
February	3,898,566	161,863	408,016	4,468,444
March	4,060,917	161,010	373,356	4,595,283
April	4,069,966	147,945	323,900	4,541,812
May	4,105,255	156,785	328,602	4,590,642
June	4,310,208	284,356	288,500	4,883,063
July	3,676,561	252,393	303,525	4,232,480
August	4,098,193	250,176	274,549	4,622,918
September	8,232,320	55,549	333,136	8,621,005
October	4,058,203	124,188	370,399	4,552,790
November	3,793,479	150,769	336,978	4,281,225
December	4,018,996	158,858	325,927	4,503,781
2016 Total	**52,512,796**	**2,074,407**	**4,039,203**	**58,626,405**
January	3,689,508	141,413	424,602	4,255,523
February	3,465,890	128,737	314,158	3,908,785
March	3,964,313	130,772	392,126	4,487,211
April	2,556,993	117,759	319,101	2,993,853
May	3,105,768	165,014	381,389	3,652,170
June	2,898,994	48,821	272,832	3,220,646
July	4,431,825	149,864	414,160	4,995,849
August	3,673,270	130,742	310,716	4,114,728
September	4,926,212	108,164	324,109	5,358,485
October	3,484,487	139,489	425,821	4,049,797
November	3,263,543	155,590	355,541	3,774,674
December	N/A	N/A	N/A	N/A
2017 Total	**39,460,803**	**1,416,364**	**3,934,553**	**44,811,721**

e Estimated r Revised p Preliminary See footnote in Appendix B

* Due to reporting time lag and well exemptions the above figures are different from actual production.

Table 6

UNITED STATES OCS CRUDE OIL AND CONDENSATE PRODUCTION[12]

(Barrels)

YEAR	LOUISIANA	TEXAS	CALIFORNIA	TOTAL
1972	387,590,662	1,733,018	22,562,213	411,885,893
1973	374,196,856	1,617,829	18,915,314	394,729,999
1974	342,435,496	1,381,825	16,776,744	360,594,065
1975	313,592,559	1,340,136	15,304,757	330,237,452
1976	301,887,002	1,054,554	13,978,553	316,920,109
1977	290,771,605	909,037	12,267,598	303,948,240
1978	278,071,535	2,107,599	12,085,908	292,265,042
1979	271,008,916	3,595,546	10,961,076	285,565,538
1980	256,688,082	10,502,007	10,198,886	277,388,975
1981	255,875,717	14,284,661	19,605,027	289,765,405
1982	275,513,489	17,263,766	28,434,202	321,211,457
1983	298,093,559	19,710,197	30,527,487	348,331,243
1984	318,024,622	21,960,086	30,254,306	370,239,014
1985	338,901,863	20,640,957	29,781,465	389,324,285
1986	340,152,276	19,835,882	29,227,846	389,216,004
1987	307,950,881	24,634,142	33,556,686	366,141,709
1988	261,936,530	26,115,776	32,615,118	320,667,424
1989	246,207,653	25,887,841	33,072,161	305,167,655
1990	264,670,535	24,970,114	33,312,719	324,423,181
1991	262,647,733	24,380,908	29,146,090	323,831,064
1992	288,918,208	23,639,788	41,222,801	346,053,626
1993	293,443,881	20,376,996	50,078,144	358,655,540
1994	293,077,191	26,819,958	57,229,464	371,300,873
1995	320,255,087	20,419,104	71,254,440	416,293,300
1996	349,101,048	25,841,553	67,804,200	436,634,538
1997	399,536,004	28,718,405	58,279,489	469,873,968
1998	425,865,901	27,837,631	40,636,231	484,861,417
1999	451,391,454	31,758,296	42,071,101	537,198,889
2000	477,645,662	35,044,216	34,373,524	557,370,524
2001	502,115,031	42,991,844	34,763,192	592,514,727
	GULF OF MEXICO		PACIFIC	TOTAL
	CENTRAL	**WESTERN**		
2002	**521,432,474**	**46,423,253**	**29,783,000**	**597,638,727**
2003	509,552,915	51,825,370	30,001,000	591,379,285
2004	482,598,762	52,683,149	27,510,000	562,791,911
2005	418,763,978	48,155,514	26,498,079	493,417,571
2006	431,633,489	40,379,554	25,992,128	498,005,171
2007	435,264,843	32,704,378	24,623,593	492,592,814
2008	396,112,395	27,297,077	24,029,346	447,438,818
2009	544,854,279	25,399,965	22,306,167	592,560,411
2010	541,600,736	20,900,548	21,708,034	584,209,318
2011	451,838,190	29,695,690	19,816,847	501,350,727
2012	422,692,750	42,005,409	17,678,497	482,376,656
2013	415,760,908 r	43,125,370 r	18,558,778	477,445,056
2014	470,176,016 r	40,308,758 r	18,481,821	528,966,595 r
2015	514,371,765 r	38,570,735 r	11,444,000 r	564,386,500 r
2016	537,064,665	32,517,117	6,139,000	575,720,782

e Estimated r Revised p Preliminary See footnote in Appendix B

NOTE: Starting in 2002 BOEM has not formally published production by state adjacent areas

Table 7

UNITED STATES CRUDE OIL AND CONDENSATE PRODUCTION AND IMPORTS

(Thousand barrels)

DATE	ALL OCS[7]	DOMESTIC PRODUCTION[7]	IMPORTS TOTAL[7]	IMPORTS SPR[7]
1997	478,775	2,339,981	2,918,425	0
1998	476,655	2,293,763	3,120,791	0
1999	513,318	2,162,752	3,132,376	2,065
2000	558,242	2,135,062	3,271,257	3,006
2001	591,588	2,136,179	3,334,438	3,914
2002	597,594 r	2,097,124 r	3,336,175	5,767
2003	599,132 r	2,073,454 r	3,527,696	747
2004	558,952 r	1,983,300 r	3,692,063	30,646
2005	494,332 r	1,890,107 r	3,663,887	14,746
2006	498,003 r	1,856,608 r	3,693,081	3,086
2007	492,593 r	1,853,243	3,661,404	2,703
2008	447,352 r	1,830,415 r	3,580,694	7,113
2009	592,609 r	1,954,241	3,289,675	20,368
2010	588,334	1,998,452 r	3,362,856	0
2011	500,519 r	2,060,744 r	3,261,422	0
2012	480,944 r	2,374,135 r	3,120,755	0
2013	476,598 r	2,725,665 r	2,821,480	0
2014	528,463 r	3,198,695 r	2,680,626	0
2015	564,342 r	3,434,019 r	2,687,409	0
January	49,952 r	284,780 r	236,065 r	0
February	45,442 r	264,107 r	229,492 r	0
March	50,498 r	283,160 r	248,383 r	0
April	47,700 r	267,193 r	228,344 r	0
May	49,939 r	274,635 r	245,749 r	0
June	47,026 r	261,080 r	226,802 r	0
July	48,860 r	269,130 r	250,986 r	0
August	50,678 r	270,207 r	248,482 r	0
September	45,534 r	256,602 r	241,213 r	0
October	50,245 r	272,520 r	234,666 r	0
November	50,879 r	266,282 r	240,691 r	0
December	54,131 r	271,896 r	242,335 r	0
2016 Total	**590,884 r**	**3,241,592 r**	**2,873,208 r**	**0**
January	54,192	273,569	261,497	0
February	48,768	253,267	220,906	0
March	54,254	282,307	249,501	0
April	49,368	272,792	243,922	0
May	51,076	283,169	260,322	0
June	48,734	272,035	240,308	0
July	54,183	285,465	242,580	0
August	52,101	284,909	244,595	0
September	49,952	284,441	218,262	0
October	45,372	298,732	235,946	0
November	53,219 e	299,153 e	246,182 e	0
December	56,621 e	301,671 e	248,136 e	0
2017 Total	**617,840 e**	**3,391,511 e**	**2,912,157 e**	**0 p**

e Estimated r Revised p Preliminary See footnote in Appendix B

* Due to reporting time lag and well exemptions the above figures are different from actual production

Table 8

LOUISIANA STATE ROYALTY OIL, GAS AND PLANT PRODUCTS
CALCULATED VOLUMES, Excluding OCS

DATE	OIL (Barrels)	GAS (MCF)	PLANT LIQUIDS (Barrels)
1997	6,534,913	60,778,002	1,440,435
1998	6,604,124	56,691,269	331,767
1999	6,030,138	51,051,870	204,124
2000	6,366,604	53,780,835	355,112
2001	7,059,789	65,034,347	983,641
2002	4,707,772	53,434,290	800,697
2003	4,910,469	53,135,969	1,459,006
2004	4,222,899	45,261,610	2,185,235
2005	3,340,640	34,454,802	1,101,153
2006	3,611,971	40,978,902	1,399,577
2007	4,554,260	43,242,493	1,416,364
2008	4,301,480	44,210,090	1,482,867
2009	4,094,544	41,624,043	721,985
2010	3,912,951	37,204,336	4,784,684
2011	3,901,117	42,335,904	5,506,453
2012	3,898,453	43,827,524	5,796,373
2013	4,010,856	44,018,931	10,239,741
2014	3,789,924	39,516,318	9,251,536
2015	3,405,308 r	35,475,013 r	8,141,362 r
January	237,989 r	2,578,056 r	590,698 r
February	261,558 r	2,388,586 r	528,184 r
March	276,826 r	2,485,504 r	572,128 r
April	275,650 r	2,343,281 r	557,795 r
May	267,105 r	2,499,671 r	539,232 r
June	257,487 r	2,381,694 r	530,767 r
July	255,558 r	2,408,308 r	591,645 r
August	250,846 r	2,280,195 r	549,552 r
September	237,589 r	2,220,748 r	517,033 r
October	246,314 r	2,160,591 r	526,010 r
November	207,642 r	2,098,620 r	466,577 r
December	198,074 r	2,105,511 r	440,788 r
2016 Totals	**2,972,638 r**	**27,950,764**	**6,410,410**
January	227,850	2,087,536	400,538
February	203,117	1,895,822	335,900
March	212,723	1,986,628	383,298
April	218,975	1,648,666	389,108
May	229,430	1,931,904	467,160
June	203,155	1,841,380	440,334
July	218,408	1,822,099	577,653
August	208,078	1,763,559 e	420,758 e
September	196,381 e	1,717,581 e	395,860 e
October	203,593 e	1,671,054 e	402,733 e
November	171,629 e	1,623,124 e	357,229 e
December	163,720 e	1,628,454 e	337,485 e
2017 Totals	**2,457,060 e**	**21,617,807 e**	**4,908,055 e**

e Estimated r Revised p Preliminary See footnote in Appendix B

Table 9
LOUISIANA STATE NATURAL GAS PRODUCTION
WET AFTER LEASE SEPARATION
Excluding OCS and Casinghead Gas
(Thousand Cubic Feet (MCF) at 15.025 psia and 60 degrees Fahrenheit)

DATE	NORTH	SOUTH	OFFSHORE	TOTAL
1997	406,306,877	900,334,348	143,913,520	1,450,554,745
1998	386,628,112	891,315,044	127,056,460	1,404,999,616
1999	355,536,417	858,338,237	100,525,024	1,314,399,678
2000	358,193,670	880,522,742	94,251,610	1,332,968,022
2001	370,998,160	903,068,572	97,208,445	1,371,275,177
2002	370,358,148	803,816,704	87,069,617	1,261,244,469
2003	401,217,674	779,381,241	72,327,053	1,252,925,968
2004	462,100,053	741,913,556	59,881,419	1,263,895,028
2005	526,863,613	645,073,330	46,609,741	1,218,546,684
2006	562,637,880	659,271,052	62,090,012	1,283,998,944
2007	603,078,425	611,264,372	65,638,857	1,279,981,654
2008	676,367,962	542,416,864	79,984,290	1,298,769,116
2009	903,727,141	444,014,121	70,811,813	1,418,553,075
2010	1,603,226,702	359,800,310	62,296,972	2,025,323,984
2011	2,449,125,453	339,286,937	63,099,986	2,851,512,376
2012	2,504,650,215	322,427,305	71,866,441	2,898,943,961
2013	1,858,426,760	338,932,998	58,666,623	2,256,026,381
2014	1,526,458,894	308,016,621	42,805,939	1,877,281,454
2015	1,404,690,805 r	283,206,496 r	32,625,158 r	1,720,522,459 r
January	122,332,292 r	20,989,080 r	2,395,083	145,716,455 r
February	116,264,255 r	18,846,776 r	2,187,130	137,298,161 r
March	118,925,857 r	20,604,472 r	2,247,272	141,777,601 r
April	122,510,093 r	19,573,784 r	1,975,086	144,058,963 r
May	120,977,607 r	19,090,013 r	2,038,991	142,106,611 r
June	112,489,934 r	18,249,683 r	2,082,894	132,822,511 r
July	125,618,627 r	18,916,690 r	2,061,415	146,596,732 r
August	115,805,474 r	18,022,025 r	1,974,196	135,801,695 r
September	116,705,013 r	17,684,752 r	1,867,790	136,257,555 r
October	121,074,666 r	17,365,664 r	1,981,817 r	140,422,147 r
November	114,317,237 r	16,651,762 r	1,895,479 r	132,864,478 r
December	122,182,911 r	16,999,078 r	1,912,155 r	141,094,144 r
2016 Total	**1,429,203,966 r**	**222,993,779 r**	**24,619,308 r**	**1,676,817,053 r**
January	139,730,887	16,778,569	1,802,529	158,311,985
February	116,143,240	16,082,275	1,389,926	133,615,441
March	136,414,231	17,986,283	1,652,763	156,053,277
April	129,468,771	16,296,728	1,563,248	147,328,747
May	132,902,881	17,465,530	1,613,498	151,981,909
June	141,371,490	16,904,576	1,677,057	159,953,123
July	138,730,042	17,028,435	1,648,927	157,407,404
August	147,976,078	16,654,223	1,550,472	166,180,773
September	137,786,055	16,718,069	1,576,334	156,080,458
October	139,445,852 e	16,801,579 e	1,578,895 e	157,826,326 e
November	140,751,567 e	16,669,984 e	1,572,122 e	158,993,673 e
December	140,627,855 e	16,623,488 e	1,551,582 e	158,802,925 e
2017 Total	**1,641,348,949 e**	**202,009,740 e**	**19,177,353 e**	**1,862,536,042 e**

e Estimated r Revised p Preliminary See footnote in Appendix B

Table 10

LOUISIANA STATE CASINGHEAD GAS PRODUCTION, WET AFTER LEASE SEPARATION, Excluding OCS

(Thousand Cubic Feet (MCF) at 15.025 psia and 60 degrees Fahrenheit)

DATE	NORTH	SOUTH	OFFSHORE	TOTAL
1997	35,537,210	107,984,665	17,042,997	160,564,872
1998	42,629,820	117,397,217	17,264,409	177,291,446
1999	29,943,303	99,043,293	15,304,875	144,291,471
2000	23,214,008	98,062,634	13,295,103	134,571,745
2001	19,843,912	90,200,751	14,001,877	124,046,540
2002	16,711,388	72,739,365	11,166,555	100,617,308
2003	15,270,654	65,328,195	11,086,256	91,685,105
2004	13,325,138	64,252,316	8,252,738	85,830,192
2005	11,006,284	48,525,678	6,876,708	66,408,670
2006	9,217,910	51,568,797	5,183,113	65,969,820
2007	8,385,917	61,102,107	5,842,664	75,330,688
2008	7,686,180	49,011,952	3,951,968	60,650,100
2009	7,405,876	45,822,387	4,050,916	57,279,179
2010	7,042,385	48,420,430	6,175,270	61,638,085
2011	7,251,475	53,008,327	6,788,281	67,048,083
2012	7,483,821	53,411,350	4,972,599	65,867,770
2013	7,063,257	54,872,105	4,693,333	66,628,695
2014	6,284,596	54,977,775	5,132,659	66,395,030
2015	5,475,930 r	51,871,669 r	4,268,416	61,616,015 r
January	405,592 r	3,594,586 r	285,564	4,285,742 r
February	378,185 r	3,508,101 r	263,928	4,150,214 r
March	406,440 r	3,706,929 r	290,208	4,403,577 r
April	379,666 r	3,552,653 r	259,261 r	4,191,580 r
May	402,585 r	3,528,332 r	288,794	4,219,711 r
June	387,046 r	3,453,710 r	297,433	4,138,189 r
July	405,507 r	3,465,258 r	278,759	4,149,524 r
August	387,487 r	3,375,436 r	273,269 r	4,036,192 r
September	377,765 r	3,443,696 r	252,856 r	4,074,317 r
October	375,161 r	3,548,468 r	263,682 r	4,187,311 r
November	356,444 r	3,271,251 r	247,282 r	3,874,977 r
December	355,822 r	3,466,255 r	295,260 r	4,117,337 r
2016 Total	**4,617,700 r**	**41,914,675 r**	**3,296,296 r**	**49,828,671 r**
January	343,415	3,604,983	270,142	4,218,540
February	436,342	3,240,618	285,885	3,962,845
March	410,810	3,416,088	281,231	4,108,129
April	398,385	3,360,092	303,480	4,061,957
May	398,443	3,274,419	300,866	3,973,728
June	401,431	3,141,746	276,174	3,819,351
July	422,501	3,359,483	257,401	4,039,385
August	421,350	3,192,537	238,748	3,852,635
September	406,380	3,229,733	271,204	3,907,317
October	407,971 e	3,203,948 e	264,845 e	3,876,764 e
November	409,867 e	3,190,009 e	257,749 e	3,857,625 e
December	411,546 e	3,199,556 e	254,120 e	3,865,221 e
2017 Total	**4,868,440 e**	**39,413,212 e**	**3,261,845 e**	**47,543,498 e**

e Estimated r Revised p Preliminary See footnote in Appendix B

Figure 4

LOUISIANA STATE GAS PRODUCTION
Actual and Forecasted Through Year 2030

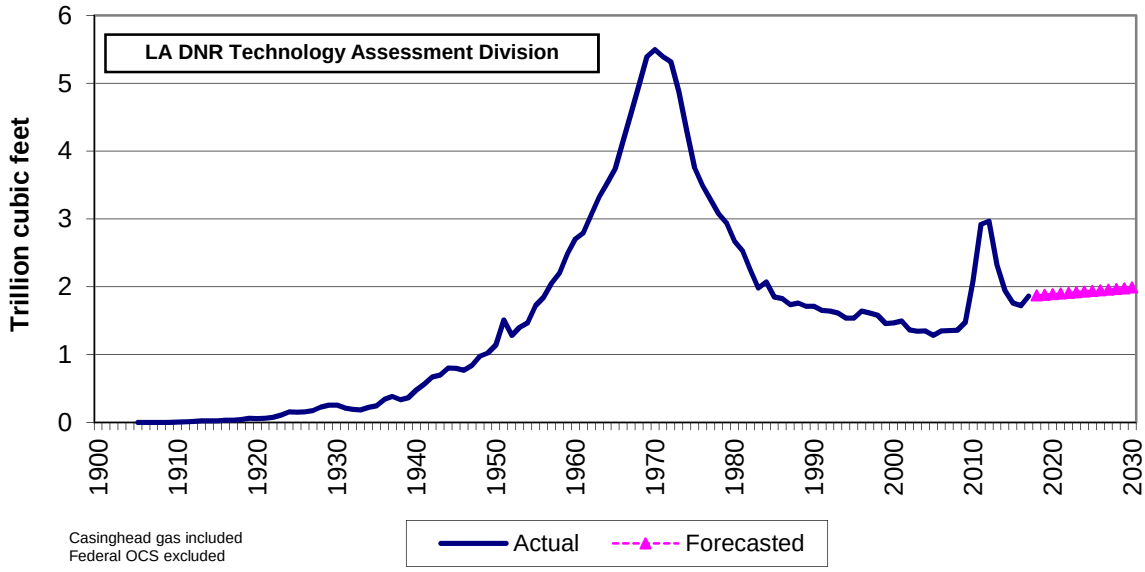
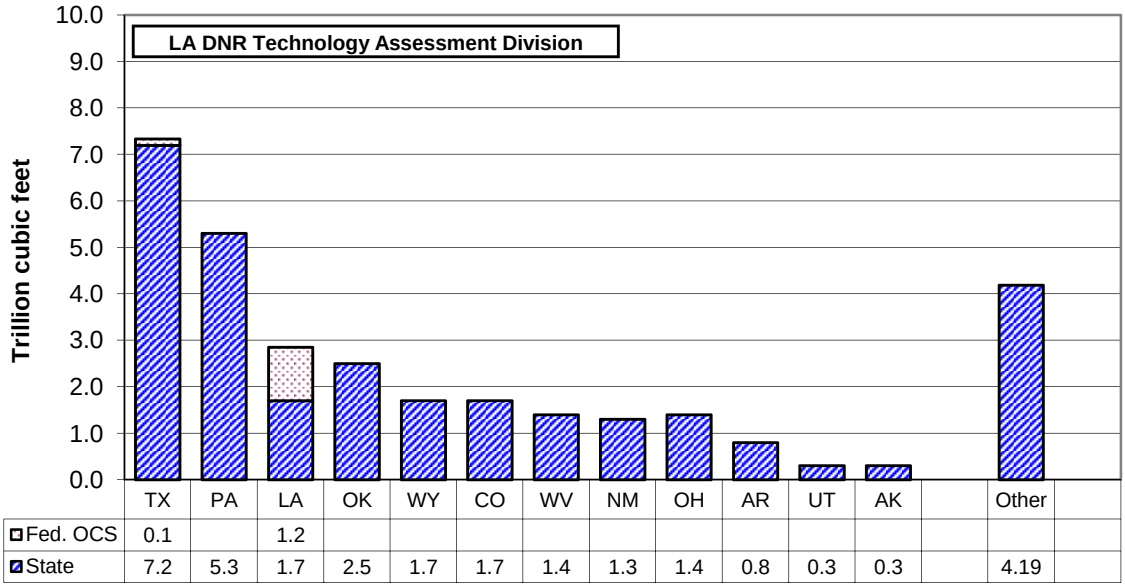


Figure 5

2016 UNITED STATES MARKETED GAS PRODUCTION BY STATE



	TX	PA	LA	OK	WY	CO	WV	NM	OH	AR	UT	AK		Other	
Fed. OCS	0.1		1.2												
State	7.2	5.3	1.7	2.5	1.7	1.7	1.4	1.3	1.4	0.8	0.3	0.3		4.19	

Federal OCS Production estimated

Table 11

LOUISIANA STATE GAS PRODUCTION, WET AFTER LEASE SEPARATION

Natural Gas and Casinghead Gas, Excluding OCS

(Thousand Cubic Feet (MCF) at 15.025 psia and 60 degrees Fahrenheit)*

DATE	NORTH	SOUTH	OFFSHORE	TOTAL
1997	441,844,087	1,008,319,013	160,956,517	1,611,119,617
1998	429,257,932	1,008,712,261	144,320,869	1,582,291,062
1999	385,479,720	957,381,530	115,829,899	1,458,691,149
2000	381,407,678	978,585,376	107,546,713	1,467,539,767
2001	390,842,072	993,269,323	111,210,322	1,495,321,717
2002	387,069,536	876,556,069	98,236,172	1,361,861,777
2003	416,488,328	844,709,436	83,413,309	1,344,611,073
2004	475,425,191	806,165,872	68,134,157	1,349,725,220
2005	537,869,897	693,599,008	53,486,449	1,284,955,354
2006	571,855,790	710,839,849	67,273,125	1,349,968,764
2007	611,464,342	672,366,479	71,481,521	1,355,312,342
2008	684,054,142	591,428,816	83,936,258	1,359,419,216
2009	911,133,017	489,836,508	74,862,729	1,475,832,254
2010	1,610,269,087	408,220,740	68,472,242	2,086,962,069
2011	2,456,376,928	392,295,264	69,888,267	2,918,560,459
2012	2,512,134,036	375,838,655	76,839,040	2,964,811,731
2013	1,865,490,017	393,805,103	63,359,956	2,322,655,076
2014	1,532,743,490	362,994,396	47,938,598	1,943,676,484
2015	1,410,166,735 r	335,078,165 r	36,893,574	1,782,138,474 r
January	122,737,884 r	24,583,666 r	2,680,647	150,002,197 r
February	116,642,440 r	22,354,877 r	2,451,058	141,448,375 r
March	119,332,297 r	24,311,401 r	2,537,480	146,181,178 r
April	122,889,759 r	23,126,437 r	2,234,347 r	148,250,543 r
May	121,380,192 r	22,618,345 r	2,327,785	146,326,322 r
June	112,876,980 r	21,703,393 r	2,380,327	136,960,700 r
July	126,024,134 r	22,381,948 r	2,340,174	150,746,256 r
August	116,192,961 r	21,397,461 r	2,247,465 r	139,837,887 r
September	117,082,778 r	21,128,448 r	2,120,646 r	140,331,872 r
October	121,449,827 r	20,914,132 r	2,245,499 r	144,609,458 r
November	114,673,681 r	19,923,013 r	2,142,761 r	136,739,455 r
December	122,538,733 r	20,465,333 r	2,207,415 r	145,211,481 r
2016 Total	**1,433,821,666 r**	**264,908,454 r**	**27,915,604 r**	**1,726,645,724 r**
January	140,074,302	20,383,552	2,072,671	162,530,525
February	116,579,582	19,322,893	1,675,811	137,578,286
March	136,825,041	21,402,371	1,933,994	160,161,406
April	129,867,156	19,656,820	1,866,728	151,390,704
May	133,301,324	20,739,949	1,914,364	155,955,637
June	141,772,921	20,046,322	1,953,231	163,772,474
July	139,152,543	20,387,918	1,906,328	161,446,789
August	148,397,428	19,846,760	1,789,220	170,033,408
September	138,192,435	19,947,803	1,847,538	159,987,775
October	139,853,823 e	20,005,527 e	1,843,741 e	161,703,091 e
November	141,161,434 e	19,859,993 e	1,829,871 e	162,851,299 e
December	141,039,401 e	19,823,044 e	1,805,702 e	162,668,146 e
2017 Total	**1,646,217,389 e**	**241,422,952 e**	**22,439,198 e**	**1,910,079,539 e**

e Estimated r Revised p Preliminary See footnote in Appendix B

Table 12

LOUISIANA and GOM CENTRAL NATURAL GAS and CASINGHEAD PRODUCTION

Natural Gas and Casinghead Gas

(Thousand Cubic Feet (MCF) at 15.025 psia and 60 degrees Fahrenheit)*

	ONSHORE	OFFSHORE		TOTAL
DATE		State	GOM Central	
1997	1,450,163,100	160,956,517	4,065,406,053	5,676,525,670
1998	1,437,970,193	144,320,869	4,050,232,219	5,632,523,281
1999	1,342,861,250	115,829,899	4,114,592,335	5,573,283,484
2000	1,359,993,054	107,546,713	4,039,065,859	5,506,605,626
2001	1,384,111,395	111,210,322	4,118,472,221	5,613,793,938
2002	1,263,625,605	98,236,172	3,711,664,200	5,073,525,977
2003	1,261,197,764	83,413,309	3,498,876,681	4,843,487,754
2004	1,281,591,063	68,134,157	3,048,397,242	4,398,122,462
2005	1,231,468,905	53,486,449	2,393,359,338	3,678,314,692
2006	1,282,636,419	67,273,962	2,272,400,259	3,622,369,023
2007	1,283,766,986	71,412,494	2,292,135,779	3,647,448,121
2008	1,275,482,958	83,936,258	1,930,267,479	3,289,686,695
2009	1,400,969,525	74,862,729	2,084,867,099	3,560,699,353
2010	2,018,489,827	68,472,242	1,943,658,414	4,030,620,483
2011	2,848,672,192	69,888,267	1,574,039,140	4,492,599,599
2012	2,887,972,691	76,839,040	1,317,720,101	4,282,531,832
2013	2,259,295,120	63,359,956	1,153,096,210	3,475,751,286
2014	1,895,737,886	47,938,598	1,137,409,420	3,081,085,904
2015	1,745,244,900 r	36,893,574 r	1,170,127,267 r	2,952,265,741 r
January	147,321,550 r	2,680,647 r	95,046,441 r	245,048,638 r
February	138,997,317 r	2,451,058 r	88,301,640 r	229,750,015 r
March	143,643,698 r	2,537,480 r	97,563,405 r	243,744,583 r
April	146,016,196 r	2,234,347 r	89,654,700 r	237,905,243 r
May	143,998,537 r	2,327,785 r	97,371,671 r	243,697,993 r
June	134,580,373 r	2,380,327 r	85,043,742 r	222,004,442 r
July	148,406,082 r	2,340,174 r	91,352,879 r	242,099,135 r
August	137,590,422 r	2,247,465 r	93,494,990 r	233,332,877 r
September	138,211,226 r	2,120,646 r	85,736,198 r	226,068,070 r
October	142,363,959 r	2,245,499 r	93,248,028 r	237,857,486 r
November	134,596,694 r	2,142,761 r	89,295,124 r	226,034,579 r
December	143,004,066 r	2,207,415 r	95,121,473 r	240,332,954 r
2016 Total	**1,698,730,120 r**	**27,915,604 r**	**1,101,230,291 r**	**2,827,876,015 r**
January	160,457,854	2,072,671	94,059,024	256,589,549
February	135,902,475	1,675,811	82,263,447	219,841,733
March	158,227,412	1,933,994	95,349,833	255,511,239
April	149,523,976	1,866,728	87,038,572	238,429,276
May	154,041,273	1,914,364	87,554,407	243,510,044
June	161,819,243	1,953,231	79,538,212	243,310,686
July	159,540,461	1,906,328	86,117,815	247,564,604
August	168,244,188	1,789,220	82,063,392	252,096,800
September	158,140,237	1,847,538	71,127,929	231,115,704
October	159,859,350 e	1,843,741 e	76,629,697 e	161,703,091 e
November	161,021,427 e	1,829,871 e	82,957,352 e	162,851,299 e
December	160,862,445 e	1,805,702 e	88,370,173 e	162,668,146 e
2017 Total	**1,887,640,341 e**	**22,439,198 e**	**1,013,069,854 e**	**2,675,192,170 e**

e Estimated r Revised p Preliminary See footnote in Appendix B

Figure 6

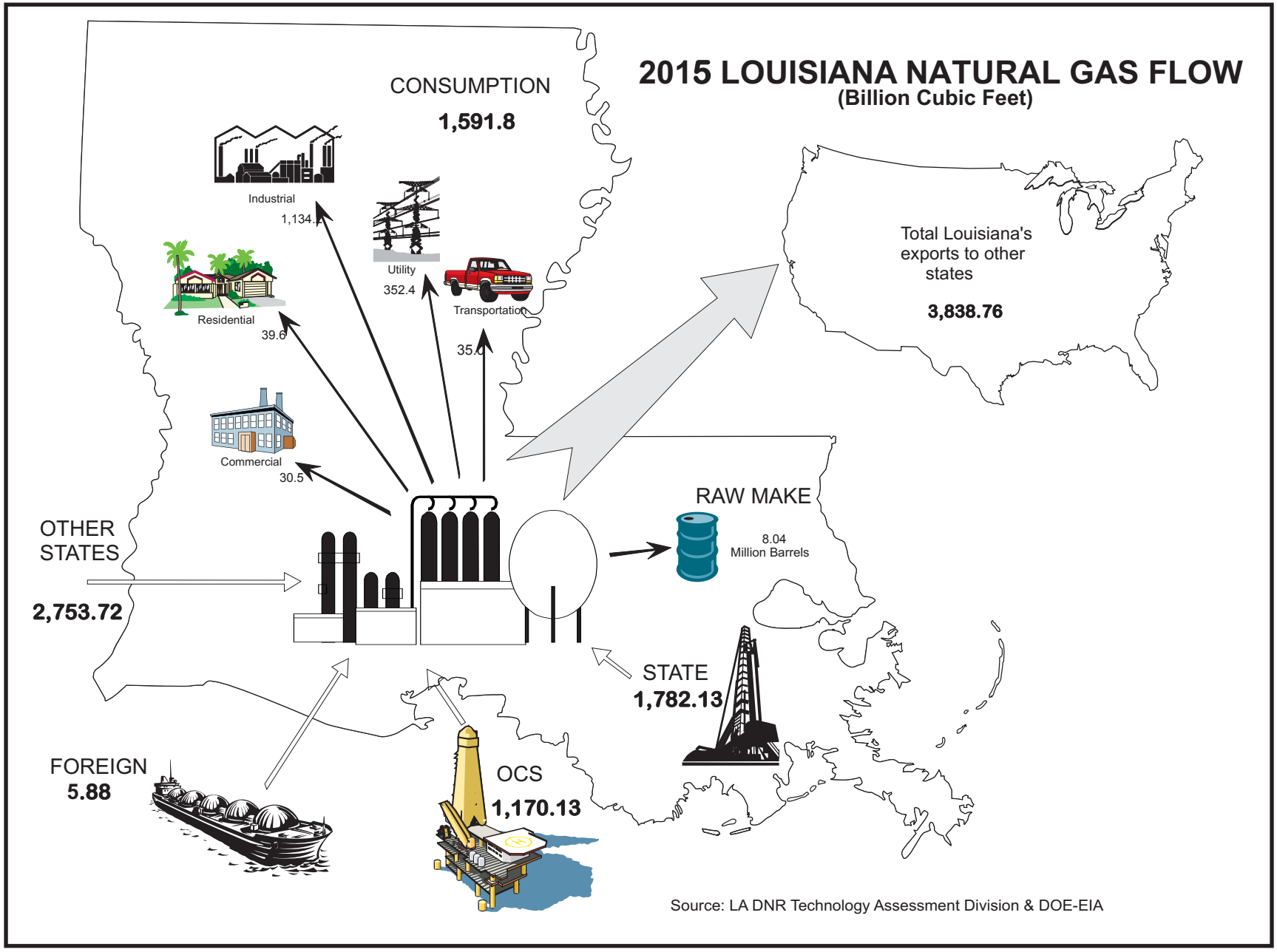

2015 LOUISIANA NATURAL GAS FLOW
(Billion Cubic Feet)
CONSUMPTION
1,591.8
Industrial
1,134.1
Utility
352.4
Residential
39.6
Transportation
35.0
Commercial
30.5
Total Louisiana's exports to other states
3,838.76
RAW MAKE
8.04
Million Barrels
OTHER STATES
2,753.72
STATE
1,782.13
OCS
1,170.13
FOREIGN
5.88
Source: LA DNR Technology Assessment Division & DOE-EIA

Table 13

GULF OF MEXICO MARKETED GAS PRODUCTION[3]

(Billion Cubic Feet (BCF) at 15.025 psia and 60 degrees Fahrenheit)

DATE	Alabama	Florida	Louisiana	Federal OCS GOM	Mississippi	Texas
1973	11.0	33.2	8,080.6	N/A **	97.7	8,346.7
1974	27.3	37.4	7,601.4	N/A **	77.2	8,010.4
1975	37.1	43.5	6,951.4	N/A **	72.9	7,338.8
1976	40.6	42.3	6,869.0	N/A **	69.4	7,050.7
1977	56.1	47.2	7,073.3	N/A **	81.4	6,912.6
1978	83.9	50.6	7,329.7	N/A **	104.5	6,419.6
1979	84.1	49.2	7,123.6	N/A **	141.2	7,033.8
1980	64.0	39.8	6,803.7	N/A **	171.6	6,976.2
1981	77.7	31.8	6,647.1	N/A **	177.7	6,774.4
1982	73.5	22.1	6,050.5	N/A **	163.9	6,341.8
1983	89.0	20.6	5,227.4	N/A **	148.2	5,822.0
1984	99.8	12.3	5,710.7	N/A **	154.8	6,063.6
1985	105.2	10.3	4,915.3	N/A **	141.3	5,933.8
1986	105.1	8.7	4,799.3	N/A **	138.1	6,031.0
1987	114.9	8.1	5,021.9	N/A **	137.0	6,006.0
1988	127.0	7.3	5,078.6	N/A **	121.6	6,162.6
1989	125.9	7.4	4,978.4	N/A **	100.6	6,118.9
1990	132.6	6.4	5,139.1	N/A **	92.8	6,218.6
1991	167.5	4.8	4,935.5	N/A **	105.9	6,157.3
1992	348.1	6.5	4,817.8	N/A **	89.9	6,025.2
1993	380.4	6.9	4,893.1	N/A **	79.1	6,126.9
1994	505.2	7.3	5,068.2	N/A **	62.2	6,229.1
1995	509.5	6.3	5,008.1	N/A **	93.7	6,205.8
1996	520.4	5.9	5,185.9	N/A **	101.2	6,343.6
1997	381.0	6.0	1,475.5	5,103.8	105.2	5,065.9
1998	384.7	5.7	1,521.5	4,976.8	105.9	5,124.8
1999	374.2	5.8	1,536.2	4,931.0	108.8	4,955.2
2000	356.3	6.4	1,426.4	4,837.5	86.8	5,178.4
2001	349.8	5.6	1,472.6	4,928.9	105.4	5,179.0
2002	349.1	3.3	1,335.0	4,423.4	110.8	5,040.1
2003	339.3	3.0	1,323.9	4,319.9	131.3	5,140.6
2004	309.8	3.1	1,326.7	3,891.5	62.1	4,967.8
2005	290.7	2.6	1,270.6	3,070.6	51.9	5,172.8
2006	280.6	2.5	1,334.4	2,845.0	59.3	5,439.1
2007	265.1	1.7	1,338.5	2,743.8	72.0	6,003.0
2008	252.8	2.4	1,350.9	2,268.9	94.7	6,824.0
2009	231.4	0.3	1,518.2	2,381.2	86.4	6,685.1
2010	218.6	12.2	2,166.7	2,201.0	72.3	6,583.4
2011	191.7	14.8	2,969.7	1,776.7	79.9	6,973.2
2012	211.5	0.8	2,897.4	1,478.0	62.6	7,328.7
2013	192.5	0.3	2,313.9	1,283.5	58.1	7,483.7
2014	177.5	0.4	1,941.4	1,230.7	53.4	7,797.2
2015	168.2 r	N/A	1,894.9	1,304.8	N/A	7,715.2
2016	164.8 r	N/A	1,743.3	1,206.3	N/A	7,203.0

e Estimated r Revised p Preliminary See footnote in Appendix B

** Prior to 1997 Federal OCS GOM production was included in state productions

Table 14

LOUISIANA STATE GAS PRODUCTION BY TAX RATES

AS PUBLISHED IN SEVERANCE TAX REPORTS[8]

(MCF at 15.025psia and 60 degrees Fahrenheit)

DATE	FULL RATE	INCAPABLE GAS WELLS RATE	OTHER RATES	TAXED VOLUME
1997	1,343,182,922	57,663,413	9,951,387	1,410,797,722
1998	1,191,471,607	60,242,544	11,733,098	1,263,447,249
1999	1,151,493,116	57,308,865	10,617,631	1,219,419,612
2000	1,217,171,149	53,797,867	8,195,799	1,279,164,815
2001	1,264,513,132	74,687,708	7,806,688	1,347,007,528
2002	1,068,512,639	75,724,074	7,748,258	1,151,984,971
2003	1,091,483,424	80,659,914	7,963,553	1,180,106,891
2004	1,139,626,885	83,441,736	5,507,456	1,235,308,986
2005	1,130,014,025	91,951,579	5,120,095	1,227,085,699
2006	1,134,544,485	113,490,843	5,835,027	1,253,870,355
2007	1,070,511,169	122,399,829	7,550,345	1,200,461,343
2008	1,044,876,723	137,853,642	6,398,792	1,189,129,157
2009	994,356,639	168,793,831	4,489,808	1,167,640,278
2010	874,590,391	177,946,449	7,737,200	1,060,274,040
2011	729,242,365	179,471,125	9,251,347	917,964,837
2012	854,908,764	176,578,354	6,655,754	1,038,142,872
2013	758,214,527	174,056,487	8,764,522	941,035,536
2014	1,122,007,861	164,803,849	7,760,331	1,294,572,041
2015	1,160,262,405 r	146,406,047 r	7,692,660 r	1,314,361,112
January	85,268,695	11,091,940	666,378	97,027,013
February	67,253,948	10,500,395	243,118	77,997,461
March	36,443,903	8,035,684	153,879	44,633,466
April	123,124,372	12,924,835	1,271,814	137,321,021
May	64,332,658	9,833,684	507,856	74,674,198
June	78,544,396	18,412,642	581,141	97,538,179
July	47,236,056	10,870,704	591,275	58,698,035
August	87,604,233	14,085,281	516,409	102,205,923
September	42,468,350 r	10,009,197 r	555,719 r	53,033,266
October	116,643,712 r	15,372,861 r	513,107 r	132,529,680
November	75,838,380 r	9,660,971 r	463,921 r	85,963,272
December	76,488,843 r	10,581,653 r	509,646 r	87,580,142
2016 Total	**901,247,546** r	**141,379,847** r	**6,574,263** r	**1,049,201,656**
January	80,536,707	-7,655,652	402,643	73,283,698
February	98,437,820	8,127,436	402,412	106,967,668
March	66,980,335	4,752,948	330,867	72,064,150
April	72,854,248	11,277,523	439,506	84,571,277
May	71,781,447	9,084,567	350,673	81,216,687
June	154,022,583	-28,932,777	116,206	125,206,012
July	87,619,233	10,220,546	419,982	98,259,761
August	84,286,942	10,541,038	353,597	95,181,577
September	97,439,964	11,139,817	737,734	109,317,514
October	114,761,747	11,688,564	378,136	126,828,447
November	N/A	N/A	N/A	N/A
December	N/A	N/A	N/A	N/A
2017 Total	**928,721,025**	**40,244,010**	**3,931,756**	**972,896,791**

e Estimated r Revised p Preliminary See footnote in Appendix B

Table 15

UNITED STATES OCS GAS PRODUCTION[12]

Natural Gas and Casinghead Gas

(MCF at 15.025 psia and 60 degrees Fahrenheit)*

YEAR	LOUISIANA	TEXAS	CALIFORNIA	TOTAL
1972	2,824,792,196	144,267,198	9,836,582	2,978,895,976
1973	2,995,634,220	145,754,588	7,143,485	3,148,532,293
1974	3,283,413,450	156,838,375	5,464,209	3,445,716,035
1975	3,266,745,456	120,166,178	3,874,047	3,390,785,681
1976	3,431,149,749	90,764,667	3,406,969	3,525,321,386
1977	3,575,898,616	85,236,246	5,417,963	3,666,552,825
1978	4,068,255,571	227,305,175	5,166,292	4,300,727,039
1979	4,076,873,552	501,546,069	5,431,822	4,583,851,442
1980	3,934,902,550	612,378,333	5,900,023	4,553,180,906
1981	4,025,867,929	715,937,640	12,763,307	4,754,568,877
1982	3,729,057,653	841,173,981	17,751,924	4,587,983,558
1983	3,111,576,348	834,112,318	24,168,292	3,969,856,958
1984	3,508,475,799	913,008,621	46,363,899	4,467,848,319
1985	3,055,687,773	818,533,627	64,558,213	3,938,779,613
1986	2,870,347,386	959,161,285	59,078,021	3,888,586,692
1987	3,117,669,167	1,180,839,487	54,805,158	4,353,313,812
1988	3,036,077,646	1,155,285,485	49,167,638	4,240,530,769
1989	2,947,545,132	1,142,237,197	50,791,912	4,140,574,242
1990	3,633,554,307	1,321,607,333	49,972,764	5,005,134,404
1991	3,225,373,562	1,161,671,524	51,855,577	4,438,900,663
1992	3,272,561,370	1,215,055,449	55,231,660	4,608,807,577
1993	3,320,312,261	1,007,755,289	52,150,277	4,455,275,861
1994	3,423,837,064	994,291,314	53,560,686	4,578,282,175
1995	3,564,677,663	890,682,224	54,790,061	4,619,222,806
1996	3,709,198,609	953,772,416	66,783,677	4,955,474,989
1997	3,825,354,038	946,381,458	73,344,546	5,010,736,875
1998	3,814,583,541	850,572,237	74,984,850	4,789,522,576
1999	3,836,619,562	798,140,396	77,809,430	4,935,623,726
2000	3,761,812,062	869,068,079	76,074,550	4,919,901,921
2001	3,818,657,416	898,035,393	70,946,682	5,145,905,423

	GULF OF MEXICO[12]		PACIFIC[7]	TOTAL
	CENTRAL	WESTERN		
2002	3,711,664,200	812,271,646	67,816,000	4,534,984,410
2003	3,498,876,681	930,004,249	58,095,000	4,439,929,494
2004	3,048,397,242	957,120,117	54,655,000	4,016,565,923
2005	2,393,359,338	762,118,570	54,134,794	3,166,526,472
2006	2,272,400,259	649,372,254	47,153,866	2,932,821,077
2007	2,292,135,779	520,160,276	45,589,671	2,823,344,619
2008	1,930,267,479	399,312,145	46,911,954	2,340,628,188
2009	2,084,867,099	365,965,839	41,233,149	2,461,881,502
2010	1,943,658,414	304,429,714	41,238,185	2,259,136,692
2011	1,574,039,140	252,180,858	36,579,269	1,837,268,562
2012	1,317,720,101	217,944,400	27,262,401	1,546,713,065
2013	1,152,879,863 r	175,025,382 r	27,453,674	1,327,905,245 r
2014	1,137,357,554 r	139,066,666 r	28,244,946	1,276,424,220 r
2015	1,167,639,378 r	137,449,194 r	13,000,000 e,r	1,307,744,082 r
2016	1,087,954,512	117,609,632	N/A	1,205,564,144

NOTE: Starting in 2002 MMS has not formally published production by state adjacent areas

e Estimated r Revised p Preliminary See footnote in Appendix B

Figure 7

LOUISIANA OIL PRODUCTION AND PRICE

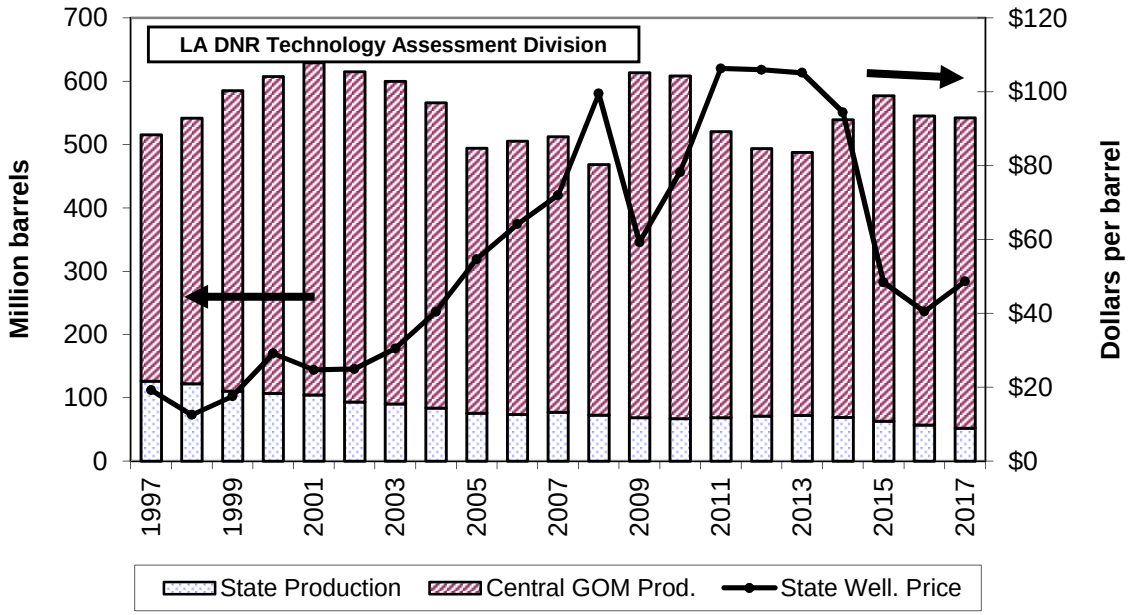


Figure 8

LOUISIANA GAS PRODUCTION AND PRICE

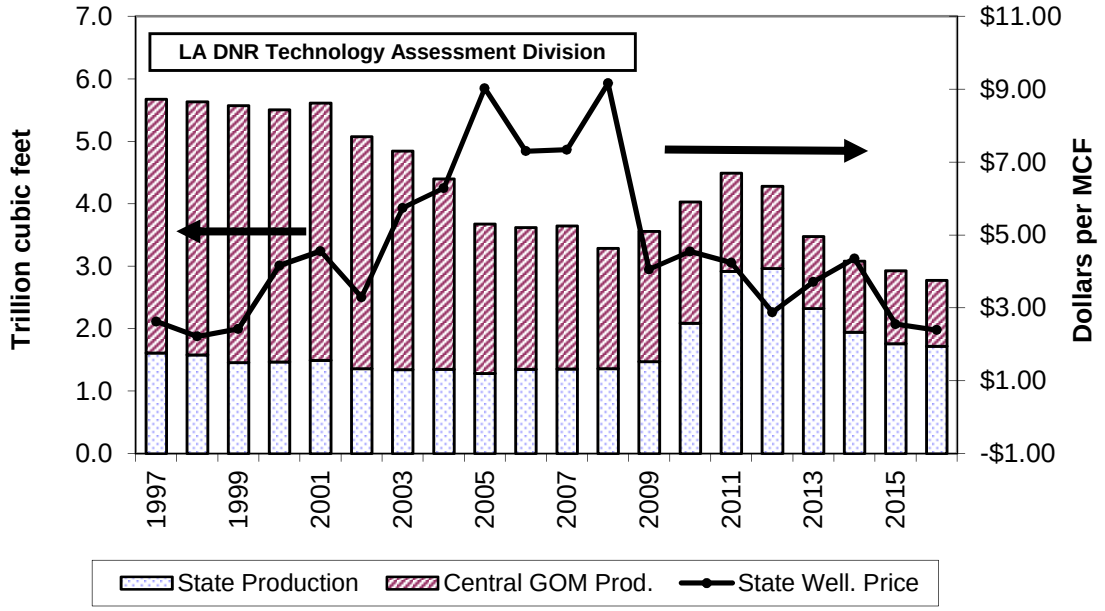


Table 16

UNITED STATES NATURAL GAS AND CASINGHEAD GAS PRODUCTION [3]

(Billion Cubic Feet (BCF) at 15.025 psia and 60 degrees Fahrenheit)*

DATE	GROSS	WET AFTER LEASE SEPARATION	MARKETED	DRY	GROSS IMPORTS
1997	23,737	19,727	19,475	18,531	2,880
1998	23,635	19,670	19,569	18,650	2,935
1999	23,355	19,524	19,416	18,462	3,090
2000	23,699	19,890	19,801	18,805	3,515
2001	24,020	20,261	20,166	19,231	3,707
2002	23,471	19,592	19,530	18,591	3,899
2003	23,645	19,678	19,582	18,724	3,937
2004	23,499	19,230	19,134	18,226	3,866
2005	22,996	18,672	18,555	17,696	4,175
2006	23,046	19,156	19,001	18,113	4,256
2007	24,108	19,940	19,626	18,714	4,104
2008	25,133	20,861	20,698	19,763	4,517
2009	25,545	21,385	21,223	20,219	3,906
2010	26,290	22,105	21,942	20,897	3,678
2011	27,920	24,621 r	23,564	22,452	3,667
2012	28,962	26,097 r	25,283 r	24,033 r	3,401
2013	28,943	26,467 r	25,562 r	24,206 r	3,076
2014	30,789	28,094 r	27,498 r	25,890 r	2,642
2015	32,915 r	29,323 r	28,772 r	27,065 r	2,642 r
January	2,828 r	2,395 r	2,443 r	2,287 r	274 r
February	2,656 r	2,276 r	2,315 r	2,167 r	252 r
March	2,828 r	2,401 r	2,449 r	2,293 r	241 r
April	2,681 r	2,313 r	2,366 r	2,215 r	241 r
May	2,787 r	2,536 r	2,433 r	2,278 r	248 r
June	2,636 r	2,404 r	2,323 r	2,175 r	242 r
July	2,730 r	2,536 r	2,421 r	2,266 r	265 r
August	2,726 r	2,586 r	2,395 r	2,242 r	262 r
September	2,630 r	2,454 r	2,304 r	2,157 r	238 r
October	2,718 r	2,493 r	2,365 r	2,214 r	231 r
November	2,673 r	2,454 r	2,310 r	2,162 r	231 r
December	2,742 r	2,579 r	2,356 r	2,206 r	281 r
2016 Total	**32,636 r**	**29,425 r**	**28,479 r**	**26,662 r**	**3,006 r**
January	2,727	2,459 e	2,339	2,191	292
February	2,504	2,337 e	2,148	2,005	255
March	2,778	2,465 e	2,381	2,220	281
April	2,682	2,376 e	2,308	2,153	238
May	2,770	2,604 e	2,397	2,227	244
June	2,682	2,469 e	2,341	2,180	240
July	2,750	2,604 e	2,443	2,277	251
August	2,764	2,655 e	2,444	2,281	248
September	2,757	2,520 e	2,408	2,551	230
October	2,757	2,560 e	2,504	2,329	244
November	2,886	2,520 e	2,495	2,321	242
December	2,905 e	2,648 e	2,513 e	2,359 e	248 e
2017 Total	**32,962 e**	**30,216.56** e	**28,721** e	**27,094 e**	**3,013 e**

e Estimated r Revised p Preliminary See footnote in Appendix B

Table 17

LOUISIANA AVERAGE CRUDE OIL PRICES

(Dollars per Barrel)

	LIGHT LOUISIANA SWEET		ALL GRADES AT WELLHEAD			
	Spot	Refinery		OCS	Severance	State
DATE	Market[10]	Posted	State[6]	Gulf[6]	Tax[8]	Royalty
1997	20.69	18.90	19.23	18.63	19.80	19.22
1998	14.21	12.17	12.52	12.03	13.47	12.31
1999	19.00	16.73	17.55	16.46	16.09	17.22
2000	30.29	27.88	29.14	27.57	28.10	25.96
2001	25.84	23.23	24.70	23.36	26.23	19.81
2002	26.18	23.14	24.93	23.49	25.17	24.39
2003	31.20	27.88	30.51	28.68	30.28	29.77
2004	41.47	37.85	40.43	37.54	38.34	39.06
2005	56.86	52.75	54.68	50.97	54.62	52.20
2006	67.44	62.41	64.17	60.62	63.55	63.08
2007	74.60	68.96	71.98	67.62	64.14	71.87
2008	102.29	96.57	99.53	100.00	104.86	97.60
2009	64.28	59.04	59.27	57.57	52.78	57.54
2010	82.72	75.90	78.23	77.13	75.24	77.71
2011	112.24	93.61	106.30	106.19	101.40	108.89
2012	111.79	93.71	105.98	105.85	107.46	110.88
2013	107.35	93.99	105.16	103.50	106.75	107.09 r
2014	96.83	88.29	94.44	93.61	96.84	95.14
2015	52.36	43.99	48.38	47.96	55.93	48.60
January	32.82	27.35	29.50	30.54	38.22	29.32 r
February	32.48	25.66	28.10	26.75	38.11	26.52 r
March	40.11	33.18	34.98	30.14	31.84	32.52 r
April	42.73	36.11	38.81	34.99	30.85	35.78 r
May	48.70	41.97	44.53	38.48	32.32	43.39 r
June	50.59	43.86	47.30	43.64	38.27	46.88 r
July	46.37	40.13	43.21	42.54	43.94	42.95 r
August	46.29	40.07	43.00	41.29	36.54	42.67 r
September	46.86	40.06	43.07	40.94	36.54	42.64 r
October	51.25	44.69	48.11	43.98	42.49	47.29 r
November	46.74	40.64	44.38	43.22	43.26	43.49 r
December	53.38	47.06	49.97	44.96	48.84	49.34 r
2016 Average	**44.86 r**	**38.40**	**41.25**	**38.46**	**38.44**	**40.23 r**
January	54.04	47.63	50.52	47.67	41.63	50.23
February	55.23	48.61	51.43	48.97	53.14	50.99
March	51.13	44.55	48.11	47.91	47.73	48.10
April	53.13	46.20	49.68	47.63	50.97	49.22
May	50.55	43.86	47.54	47.09	66.46	47.52
June	47.21	40.29	44.27	44.33	46.65	44.26
July	48.99	41.68	45.81	44.05	45.82	45.67
August	51.03	43.30	47.56	45.05	43.15	47.40
September	54.81	44.82	49.36	47.51	36.54	49.17
October	57.74	46.58	52.16	48.51	46.02	52.50
November	62.61	N/A	N/A	N/A	47.40	51.16 e
December	62.75	N/A	N/A	N/A	48.17	53.44 e
2017 Average	**54.10**	**44.75**	**48.64**	**46.87**	**47.81**	**49.14 e**

e Estimated r Revised p Preliminary See footnote in Appendix B

Figure 9

CRUDE OIL AVERAGE PRICES

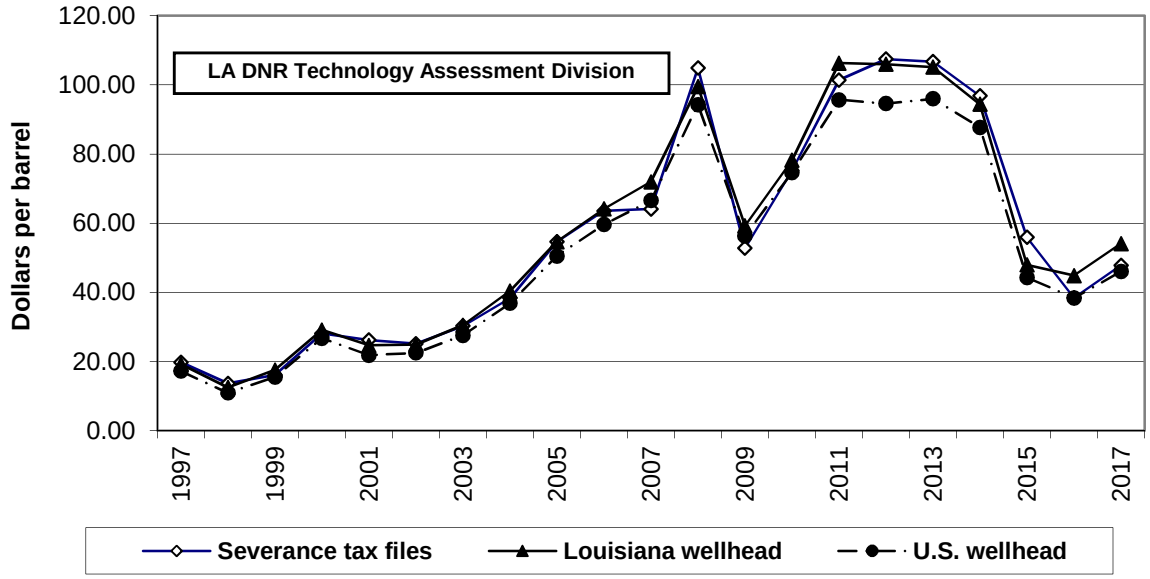


Figure 10

NATURAL GAS AVERAGE PRICES

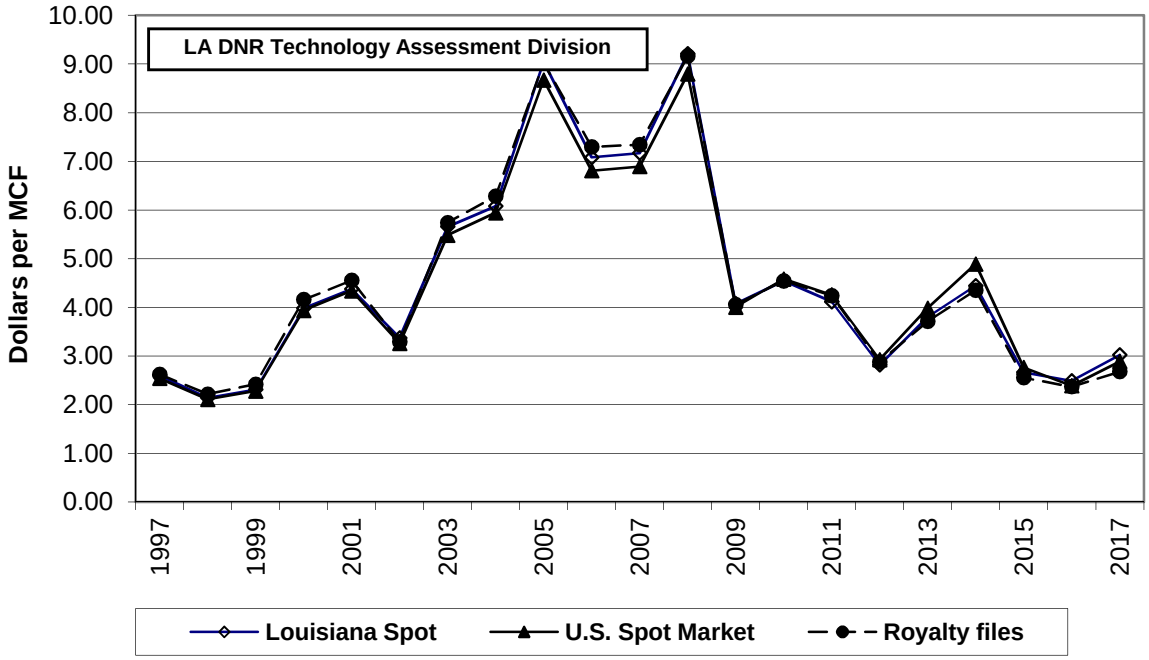


Table 18

UNITED STATES AVERAGE CRUDE OIL PRICES[2]

(Dollars per Barrel)

DATE	REFINERY ACQUISITION		DOMESTIC	IMPORTS	IMPORTS	IMPORTS
	Domestic Costs	Imports Costs	WELLHEAD	LANDED	FOB	OPEC FOB
1997	19.65	18.55	17.23	18.14	16.98	16.33
1998	13.15	12.35	10.94	11.86	10.75	10.17
1999	17.64	17.27	15.53	17.38	16.48	16.01
2000	29.42	28.13	27.15	28.01	26.76	26.03
2001	24.34	21.99	21.89	21.77	20.45	19.56
2002	24.56	23.63	22.50	23.82	22.57	22.19
2003	29.81	27.85	27.55	27.83	26.06	25.61
2004	38.97	35.79	36.86	36.05	33.73	33.99
2005	53.05	48.93	50.53	49.41	47.74	49.75
2006	62.50	58.89	59.65	59.03	57.03	59.17
2007	69.56	67.13	66.56	67.86	66.12	68.98
2008	98.09	92.30	94.22	92.14	89.45	91.23
2009	58.95	59.37	56.31	60.30	58.12	58.92
2010	77.94	75.92	74.64	76.53	74.21	75.31
2011	100.62	102.50	95.69	102.92	101.65	105.30
2012	100.91	101.07	94.63	100.86	99.54	104.08
2013	102.93	98.03	96.00	96.90	96.51	100.54
2014	94.45	89.57	87.71	88.09	85.60	89.14
2015	49.86	46.51	44.31	45.43	41.92	43.53
January	32.17	27.48	27.02	27.36 r	23.67 r	25.05
February	30.28	26.66 r	25.52 r	27.04 r	24.68	27.01 r
March	35.29	32.24 r	31.87	32.06 r	29.74 r	31.37 r
April	39.30	35.90	35.59	35.43 r	32.73 r	34.08 r
May	44.77	40.88	41.02	40.73	38.31 r	40.51 r
June	47.57	44.13	43.96	43.55	41.92	43.73 r
July	44.88	41.48	40.71 r	41.05 r	38.76	39.61 r
August	44.18	41.21	40.46	40.40	38.26 r	40.44
September	44.47 r	40.86 r	40.55 r	40.81 r	38.28 r	40.01
October	48.66 r	44.76 r	45.00	43.97 r	42.36 r	44.66
November	46.10 r	41.80 r	41.65 r	42.59 r	40.12 r	42.31 r
December	50.45 r	46.72 r	47.12 r	46.74 r	44.52 r	47.44 r
2016 Average	**42.34 r**	**38.68 r**	**38.37 r**	**38.48 r**	**36.11 r**	**38.02 r**
January	51.81	48.12	48.19	47.05	44.63	47.30
February	53.15	49.38	49.41	48.10	45.88	49.11
March	50.60	46.53	46.39	46.22	44.08	46.85
April	51.34	47.47	47.23	46.00	43.58	47.09
May	49.58	46.94	45.19	46.13	43.74	45.58
June	46.17	43.93	42.19	43.82	41.35	43.52
July	47.44	45.02	43.42	44.70	42.09	45.40
August	48.71	47.61	44.96	46.60	44.05	48.06
September	51.14	50.33	47.17	48.91	46.40	50.77
October	52.98	52.34	N/A	N/A	N/A	N/A
November	N/A	N/A	N/A	N/A	N/A	N/A
December	N/A	N/A	N/A	N/A	N/A	N/A
2017 Average	**50.29**	**47.77**	**46.02**	**46.39**	**43.98**	**47.08**

e Estimated r Revised p Preliminary See footnote in Appendix B

Table 19

LOUISIANA NATURAL GAS WELLHEAD PRICES (MCF)

(Dollars/Thousand Cubic Feet)

DATE	GOM Federal OCS[12]	DNR State Royalty	HENRY HUB Settled NYMEX	HENRY HUB Cash Spot	SPOT MARKET[5] Low	SPOT MARKET[5] High	SPOT MARKET[5] Average
1997	2.63	2.62	2.69	2.63	2.54	2.67	2.60
1998	2.36	2.22	2.19	2.17	2.08	2.18	2.14
1999	2.18	2.42	2.36	2.36	2.25	2.36	2.31
2000	3.59	4.16	4.04	4.39	3.92	4.03	3.98
2001	4.05	4.55	4.44	4.11	4.27	4.47	4.38
2002	2.98	3.29	3.39	3.48	3.29	3.43	3.37
2003	5.12	5.74	5.61	5.71	5.32	5.92	5.66
2004	6.04	6.29	6.39	6.14	5.98	6.18	6.08
2005	6.84	9.03	8.96	9.19	8.84	9.26	9.05
2006	8.24	7.35	7.54	7.00	6.91	7.24	7.08
2007	6.86	7.39	7.13	7.26	7.08	7.29	7.17
2008	9.04	9.17	9.40	9.23	9.12	9.34	9.21
2009	5.03	4.05	4.15	4.11	3.98	4.16	4.07
2010	4.10	4.54	4.57	4.56	4.47	4.61	4.55
2011	4.48	4.24	4.20	4.16	4.04	4.17	4.11
2012	3.07	2.88	2.90	2.86	2.75	2.87	2.82
2013	3.58	3.71	3.80	3.87	3.68	3.92	3.80
2014	4.28	4.35	4.59	4.54	3.98	5.14	4.44
2015	3.33	2.55	2.77	2.71	2.44	2.87	2.67
January	N/A	2.20	2.47	2.36	2.16	2.50	2.35
February	N/A	1.90	2.28	2.04	1.64	2.28	2.01
March	N/A	1.59	1.78	1.77	1.46	1.91	1.70
April	N/A	1.83	1.98	1.98	1.70	2.05	1.88
May	N/A	1.78 r	2.07	2.00	1.74	2.08	1.90
June	N/A	2.28 r	2.04	2.67	1.87	2.79	2.38
July	N/A	2.72	3.03	2.90	2.67	3.04	2.85
August	N/A	2.63	2.78	2.90	2.62	2.95	2.78
September	N/A	2.84	2.97	3.09	2.81	3.18	2.98
October	N/A	2.87 r	3.07	3.07	2.61	3.28	2.96
November	N/A	2.46 r	2.87	2.60	2.04	2.88	2.51
December	N/A	3.39 r	3.36	3.72 r	3.20	3.89	3.53
2016 Average	**2.26**	**2.37** r	**2.56**	**2.59**	2.21	**2.74**	2.49
January	N/A	3.49	4.09	3.39	3.19	4.10	3.51
February	N/A	2.89	3.53	2.93	2.48	3.53	2.96
March	N/A	2.78	2.73	2.98	2.51	3.07	2.80
April	N/A	3.19	3.30	3.20	2.70	3.30	3.13
May	N/A	3.09	3.27	3.26	3.01	3.30	3.28
June	N/A	2.96	3.37	3.06	2.80	3.37	2.98
July	N/A	2.92	3.19	3.08	2.76	3.09	2.99
August	N/A	2.88	3.09	2.98	2.74	3.08	2.93
September	N/A	2.88	3.08	3.08	2.80	3.18	2.98
October	N/A	2.34	3.09	2.98	2.75	3.09	2.92
November	N/A	2.68	2.86	3.11	2.66	3.26	2.94
December	N/A	N/A	3.20	2.83	2.62	2.95	2.78
2017 Average	**2.96** e	**2.68**	**3.23**	**3.07**	**2.75**	**3.28**	**3.02**

e Estimated r Revised p Preliminary See footnote in Appendix B

Table 19A

LOUISIANA NATURAL GAS WELLHEAD PRICES (MMBTU)

(Dollars/MMBTU)

DATE	GOM Federal OCS[12]	DNR State Royalty	HENRY HUB Settled NYMEX	HENRY HUB Cash Spot	SPOT MARKET[5] Low	SPOT MARKET[5] High	SPOT MARKET[5] Average
1997	2.53	2.52	2.59	2.53	2.44	2.57	2.50
1998	2.27	2.13	2.10	2.08	2.00	2.10	2.05
1999	2.10	2.33	2.27	2.27	2.17	2.27	2.22
2000	3.45	4.00	3.88	4.23	3.77	3.88	3.83
2001	3.89	4.38	4.27	3.95	4.11	4.30	4.21
2002	2.87	3.16	3.26	3.35	3.16	3.30	3.24
2003	4.92	5.52	5.40	5.49	5.11	5.69	5.44
2004	5.81	6.04	6.15	5.90	5.75	5.95	5.85
2005	6.58	8.68	8.62	8.83	8.50	8.90	8.70
2006	7.92	7.07	7.25	6.73	6.64	6.96	6.81
2007	6.60	7.11	6.86	6.98	6.80	7.01	6.89
2008	8.69	8.81	9.03	8.88	8.77	8.99	8.86
2009	4.84	3.90	3.99	3.95	3.82	4.00	3.92
2010	3.94	4.37	4.39	4.39 r	4.30	4.44	4.37
2011	4.31	4.08	4.04	4.00 r	3.88	4.01	3.96
2012	2.95	2.77	2.79	2.75 r	2.64	2.76	2.71
2013	3.44	3.57	3.65	3.72 r	3.54	3.77	3.65
2014	4.12	4.18	4.41	4.37 r	3.82	4.95	4.27
2015	3.20 r	2.45 r	2.66	2.61 r	2.34	2.76	2.56
January	N/A	2.11	2.37	2.27 r	2.08	2.40	2.26
February	N/A	1.82 r	2.19	1.96 r	1.58	2.19	1.93
March	N/A	1.53 r	1.71	1.70 r	1.40	1.84	1.64
April	N/A	1.76	1.90	1.90 r	1.63	1.97	1.81
May	N/A	1.71	2.00	1.92 r	1.67	2.00	1.83
June	N/A	2.19	1.96	2.57 r	1.80	2.68	2.29
July	N/A	2.61	2.92	2.79 r	2.57	2.92	2.74
August	N/A	2.53	2.67	2.79 r	2.52	2.84	2.68
September	N/A	2.73	2.85	2.97 r	2.71	3.06	2.86
October	N/A	2.76 r	2.95	2.95 r	2.51	3.15	2.84
November	N/A	2.36 r	2.76	2.50 r	1.96	2.77	2.42
December	N/A	3.26 r	3.23	3.58 r	3.08	3.74	3.39
2016 Average	**2.26**	**2.28 r**	**2.46**	**2.49 r**	**2.13**	**2.63**	**2.39**
January	N/A	3.36	3.93	3.26	3.06	3.94	3.38
February	N/A	2.78	3.39	2.82	2.38	3.39	2.84
March	N/A	2.67	2.63	2.87	2.41	2.95	2.69
April	N/A	3.06	3.18	3.08	2.59	3.17	3.01
May	N/A	2.97	3.14	3.13	2.90	3.17	3.15
June	N/A	2.85	3.24	2.94	2.69	3.24	2.87
July	N/A	2.81	3.07	2.96	2.65	2.97	2.87
August	N/A	2.77	2.97	2.87	2.64	2.96	2.82
September	N/A	2.77	2.96	2.96	2.69	3.06	2.86
October	N/A	2.25	2.97	2.87	2.64	2.97	2.81
November	N/A	2.57	2.75	2.99	2.55	3.13	2.83
December	N/A	N/A	3.07	2.72	2.52	2.84	2.68
2017 Average	**2.96**	**2.81**	**3.11**	**2.96**	**2.64**	**3.15**	**2.90**

e Estimated r Revised p Preliminary See footnote in Appendix B

Table 20

LOUISIANA AVERAGE NATURAL GAS PRICES
DELIVERED TO CONSUMER [3] (MCF)
(Dollars/Thousand Cubic Feet)

DATE	CITY GATES	RESIDENTIAL	COMMERCIAL	INDUSTRIAL	UTILITY
1997	3.04	7.16	6.22	2.87	2.79
1998	2.33	6.68	5.64	2.31	2.37
1999	2.70	6.83	5.73	2.54	2.59
2000	4.61	8.34	7.41	4.03	4.55
2001	5.55	10.47	8.58	5.04	4.30
2002	4.07	8.06	6.74	3.69	3.63
2003	5.78	10.29	8.81	5.53	5.94
2004	6.56	11.20	9.56	6.58	6.50
2005	8.56	13.26	11.41	9.11	9.14
2006	7.67	14.66	11.84	7.42	7.66
2007	7.22	14.20	11.83	7.08	7.53
2008	9.58	15.49	13.52	9.32	10.01
2009	5.96	13.15	10.46	4.31	4.35
2010	5.43 r	11.73 r	9.88 r	4.68 r	4.79 **r**
2011	5.67 r	11.37 r	9.36 r	4.25 r	4.45
2012	3.48 r	11.54 r	8.44 r	2.96 r	2.99 r
2013	4.12 r	10.80 r	8.59 r	3.86 r	3.93
2014	4.90 r	10.89 r	9.01 r	5.05 r	4.67
2015	3.32 r	10.77 r	8.01 r	3.33 r	3.17
January	3.51	9.23 r	8.02 r	3.09	w
February	3.49	8.52 r	7.69 r	2.95	w
March	3.32	10.30 r	7.69 r	2.41	w
April	3.03	11.10 r	7.12 r	2.51	w
May	2.99	13.13 r	7.26 r	2.58	2.63
June	3.16	13.87 r	7.19 r	2.50	3.08
July	4.00	15.93 r	8.22 r	3.41	w
August	3.85	16.62 r	8.27 r	3.18	w
September	4.07	15.84 r	8.28 r	3.37	w
October	3.98	16.22 r	8.47 r	3.54	w
November	4.23	14.93 r	8.21 r	4.12	w
December	4.18 r	11.00 r	8.81 r	3.80	w
2016 Average	**3.65 r**	**13.06 r**	**7.94 r**	**3.12**	**2.76 r**
January	3.91	10.96	N/A	4.64	w
February	4.37	12.38	N/A	4.68	w
March	3.96	12.80	N/A	3.69	w
April	3.94	13.65	8.70	3.23	w
May	4.08	14.99	8.84	3.41	w
June	4.03	15.53	8.86	3.84	w
July	3.99	16.56	8.82	3.71	w
August	3.85	17.42	8.76	3.64	w
September	3.84	16.60	8.78	3.56	w
October	3.91	16.63	8.72	3.63	w
November	3.92	13.34	8.85	3.50	w
December	N/A	N/A	N/A	N/A	N/A
2017 Average	**3.98**	**14.62**	**7.90**	**3.78**	**N/A**

w = Withheld to avoid disclosure of individual company data

e Estimated r Revised p Preliminary See footnote in Appendix B

Table 20A

LOUISIANA AVERAGE NATURAL GAS PRICES
DELIVERED TO CONSUMER [3] (MMBTU)
(Dollars/MMBTU)

DATE	CITY GATES	RESIDENTIAL	COMMERCIAL	INDUSTRIAL	UTILITY
1997	2.92	6.87	5.97	2.76	2.68
1998	2.24	6.41	5.41	2.22	2.28
1999	2.59	6.56	5.50	2.44	2.49
2000	4.43	8.01	7.11	3.87	4.37
2001	5.33	10.05	8.24	4.84	4.13
2002	3.91	7.74	6.47	3.54	3.48
2003	5.55	9.88	8.46	5.31	5.70
2004	6.30	10.75	9.18	6.32	6.24
2005	8.22	12.73	10.95	8.75	8.77
2006	7.36	14.07	11.37	7.12	7.35
2007	6.93	13.63	11.36	6.80	7.23
2008	9.20	14.87	12.98	8.95	9.61
2009	5.72	12.62	10.04	4.14	4.18
2010	5.21	11.26	9.48	4.49	4.60
2011	5.44	10.92	8.99	4.08	4.27
2012	3.34	11.08	8.10	2.84	2.87
2013	3.96	10.37	8.25	3.71	3.77
2014	4.70	10.45	8.65	4.85	4.49
2015	3.19	10.34	7.69	3.20	3.04
January	3.37	8.86	7.70	2.97	w
February	3.35	8.18	7.38	2.83	w
March	3.19	9.89	7.38	2.31	w
April	2.91	10.66	6.84	2.41	w
May	2.87	12.60	6.97	2.48	2.52
June	3.03	13.32	6.90	2.40	2.96
July	3.84	15.29	7.89	3.27	w
August	3.70	15.96	7.94	3.05	w
September	3.91	15.21	7.95	3.24	w
October	3.82	15.57	8.13	3.40	w
November	4.06	14.33	7.88	3.96	w
December	4.01	10.56	8.46	3.65	w
2016 Average	**3.50**	**12.54**	**7.62**	**3.00**	**2.65**
January	3.75	10.52	N/A	4.45	w
February	4.20	11.88	N/A	4.49	w
March	3.80	12.29	N/A	3.54	w
April	3.78	13.10	8.35	3.10	w
May	3.92	14.39	8.49	3.27	w
June	3.87	14.91	8.51	3.69	w
July	3.83	15.90	8	3.56	w
August	3.70	16.72	8.41	3.49	w
September	3.69	15.94	8.43	3.42	w
October	3.75	15.96	8.37	3.48	w
November	3.76	12.81	8.50	3.36	w
December	N/A	N/A	N/A	N/A	w
2016 Average	**3.82**	**14.04**	**7.58**	**3.62**	**w**

w = Withheld to avoid disclosure of individual company data

e Estimated r Revised p Preliminary See footnote in Appendix B

Table 21

UNITED STATES AVERAGE NATURAL GAS PRICES (MCF)

(Dollars/Thousand Cubic Feet)

DATE	SPOT MARKET[5]	FOREIGN IMPORTS[3]	CITY GATES[3]	DELIVERED TO RESIDENTIAL[3]	DELIVERED TO INDUSTRIAL[3]
1997	2.54	2.15	3.57	7.45	3.53
1998	2.11	1.97	3.06	7.45	3.09
1999	2.28	2.23	3.17	7.34	3.08
2000	3.94	3.88	4.66	8.51	4.45
2001	4.34	4.36	5.24	9.91	5.08
2002	3.26	3.14	4.10	8.58	4.02
2003	5.48	5.18	5.84	10.62	5.91
2004	5.94	5.78	6.61	11.64	6.51
2005	8.67	8.09	8.72	13.72	8.67
2006	6.81	6.87	8.28	14.16	7.82
2007	6.89	6.87	8.06	14.23	7.65
2008	8.80	8.77	9.59	15.76	9.66
2009	4.00	4.14	6.14	12.91	5.23
2010	4.58	4.46	6.07	12.91	5.44
2011	4.26	4.22	5.73	12.57	5.12
2012	2.93	2.88	4.71	12.03	3.85
2013	3.98	3.82	5.07	12.15	4.64
2014	4.89	5.38	5.70	12.95	5.58
2015	2.76	3.15	4.27	12.30	3.91 r
January	2.54	2.80	3.39	8.28	3.62 r
February	2.10	2.43	3.48	8.36	3.64 r
March	1.65	1.73	3.49	9.19	3.05 r
April	1.81	1.61	3.22	9.65	3.01 r
May	1.84	1.55	3.44	11.62	2.90 r
June	2.25	1.90	3.84	14.43	2.89 r
July	2.70	2.35	4.42	16.55	3.58 r
August	2.66	2.42	4.33	17.60	3.59 r
September	2.74	2.47	4.60	16.78	3.74 r
October	2.71	2.59	4.19	13.74	3.88 r
November	2.30	2.70	3.90	10.77	3.87 r
December	3.38	3.50	3.96	9.06	4.32 r
2016 Average	**2.39**	**2.34**	**3.86**	**12.17**	**3.51** r
January	3.67	3.75	4.21	9.38	4.90
February	2.98	3.14	4.13	10.06	4.60
March	2.84	2.68	3.83	9.90	3.98
April	3.01	2.64	4.17	11.35	4.17
May	3.01	2.70	4.39	13.18	4.08
June	2.84	2.62	4.78	15.96	4.10
July	2.77	2.40	4.67	17.74	3.96
August	2.70	2.38	4.57	18.09	3.83
September	2.67	2.12	4.55	17.01	3.89
October	2.61	2.05	4.06	13.50	3.82
November	2.81	2.53	3.98	10.26	3.92
December	2.80	N/A	N/A	N/A	N/A
2017 Average	**2.89**	**2.64**	**4.30**	**13.31**	**4.11**

e Estimated r Revised p Preliminary See footnote in Appendix B

Table 21A

UNITED STATES AVERAGE NATURAL GAS PRICES (MMBTU)

(Dollars/MMBTU)

DATE	SPOT MARKET[5]	FOREIGN IMPORTS	CITY GATES	DELIVERED TO RESIDENTIAL	DELIVERED TO INDUSTRIAL
1997	2.64	2.24	3.72	7.75	3.67 r
1998	2.19	2.05	3.18	7.75	3.22 r
1999	2.37	2.32	3.29	7.64	3.20 r
2000	4.09	4.03	4.84	8.85	4.63 r
2001	4.51	4.53	5.45	10.31	5.28
2002	3.39	3.26	4.26	8.92	4.18 r
2003	5.70	5.39	6.07	11.04	6.15
2004	6.18	6.01	6.87	12.10	6.77 r
2005	9.02	8.41	9.07	14.27	9.02 r
2006	7.08	7.14	8.61	14.73	8.14 r
2007	7.17	7.15	8.39	14.80	7.96 r
2008	9.15	9.13	9.97	16.39	10.05 r
2009	4.17	4.30	6.39	13.42	5.44 r
2010	4.76	4.64	6.31	13.43	5.65 r
2011	4.43	4.39	5.96	13.07	5.32 r
2012	3.04	3.00	4.90	12.51	4.00 r
2013	4.14	3.97	5.27	12.63	4.82 r
2014	5.09	5.60	5.92	13.47	5.80
2015	2.87	3.28	4.44	12.79	4.06 r
January	2.64	2.91	3.53	8.61	3.76 r
February	2.18	2.53	3.62	8.69	3.79 r
March	1.72	1.80	3.63	9.56	3.17 r
April	1.89	1.67	3.35	10.04	3.13 r
May	1.91	1.61	3.58	12.08	3.02 r
June	2.34	1.98	3.99	15.01	3.01 r
July	2.81	2.44	4.60	17.21	3.72 r
August	2.77	2.52	4.50	18.30	3.73 r
September	2.85	2.57	4.78	17.45	3.89 r
October	2.82	2.69	4.36	14.29	4.04 r
November	2.39	2.81	4.06	11.20	4.02 r
December	3.51	3.64	4.12	9.42	4.49 r
2016 Average	**2.39**	**2.34**	**3.86**	**12.17**	**3.51** r
January	3.82	3.90	4.38	9.76	5.10
February	3.10	3.27	4.30	10.46	4.78
March	2.95	2.79	3.98	10.30	4.14
April	3.13	2.75	4.34	11.80	4.34
May	3.13	2.81	4.57	13.71	4.24
June	2.95	2.72	4.97	16.60	4.26
July	2.88	2.50	4.86	18.45	4.12
August	2.81	2.48	4.75	18.81	3.98
September	2.78	2.20	4.73	17.69	4.05
October	2.72	2.13	4.22	14.04	3.97
November	2.93	2.63	4.14	10.67	4.08
December	2.91	N/A	N/A	N/A	N/A
2017 Average	**2.89**	**2.71**	**4.37**	**13.63**	**4.17**

e Estimated r Revised p Preliminary See footnote in Appendix B

Table 22

LOUISIANA STATE OIL AND GAS DRILLING PERMITS ISSUED BY TYPE
Excluding OCS

DATE	DEVELOPMENTAL +	WILDCATS =	TOTAL =	OFFSHORE +	ONSHORE
1996	1,248	133	1,381	121	1,260
1997	1424	138	1562	85	1477
1998	1,171	115	1,286	96	1,190
1999	908	109	1,017	79	938
2000	1,363	90	1,453	151	1,302
2001	1,277	88	1,365	96	1,269
2002	902	123	1,025	90	935
2003	1,152	112	1,264	83	1,181
2004	1,535	98	1,633	57	1,576
2005	1,882	114	1,996	74	1,922
2006	2,040	97	2,137	61	2,076
2007	2,082	68	2,150	34	2,116
2008	2,296	78	2,374	40	2,334
2009	1,335	30	1,365	12	1,353
2010	1,914	42	1,956	32	1,924
2011	1,638	38	1,676	36	1,640
2012	1,537	37	1,574	30	1,544
2013	1,549	29	1,578	37	1,541
2014	1,379	29	1,408	8	1,400
2015	621	22	643	4	639
January	28	0	28	0	28
February	33	0	33	0	33
March	18	1	19	0	19
April	30	2	32	0	32
May	30	1	31	0	31
June	34	1	35	0	35
July	51	1	52	0	52
August	48	5	53	0	53
September	60	0	60	0	60
October	40	2	42	0	42
November	56	2	58	0	58
December	31	1	32	0	32
2016 Total	**459**	**16**	**475**	**0**	**475**
January	76	1	77	0	77
February	59	0	59	0	59
March	83	1	84	1	83
April	55	0	55	0	55
May	52	0	52	0	52
June	74	1	75	0	75
July	47	0	47	0	47
August	68	0	68	0	68
September	42	2	44	0	44
October	76	1	77	0	77
November	72	0	72	0	72
December	51	1	52	0	52
2017 Total	**755**	**7**	**762**	**1**	**761**

e Estimated r Revised p Preliminary See footnote in Appendix B

Figure 11

LOUISIANA STATE DRILLING PERMITS ISSUED
Federal OCS Excluded

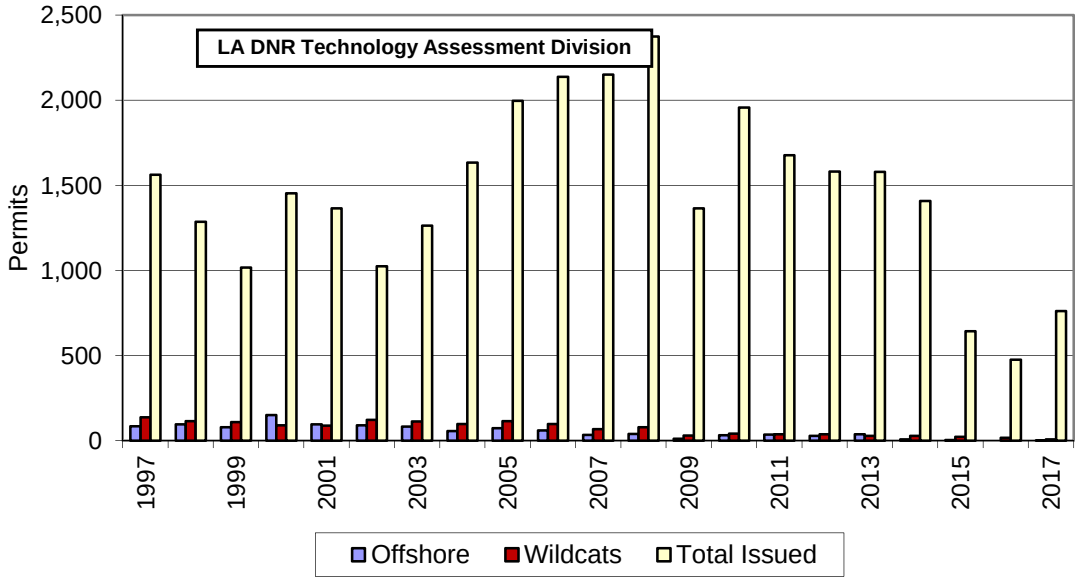


Figure 12

LOUISIANA AVERAGE ACTIVE RIGS

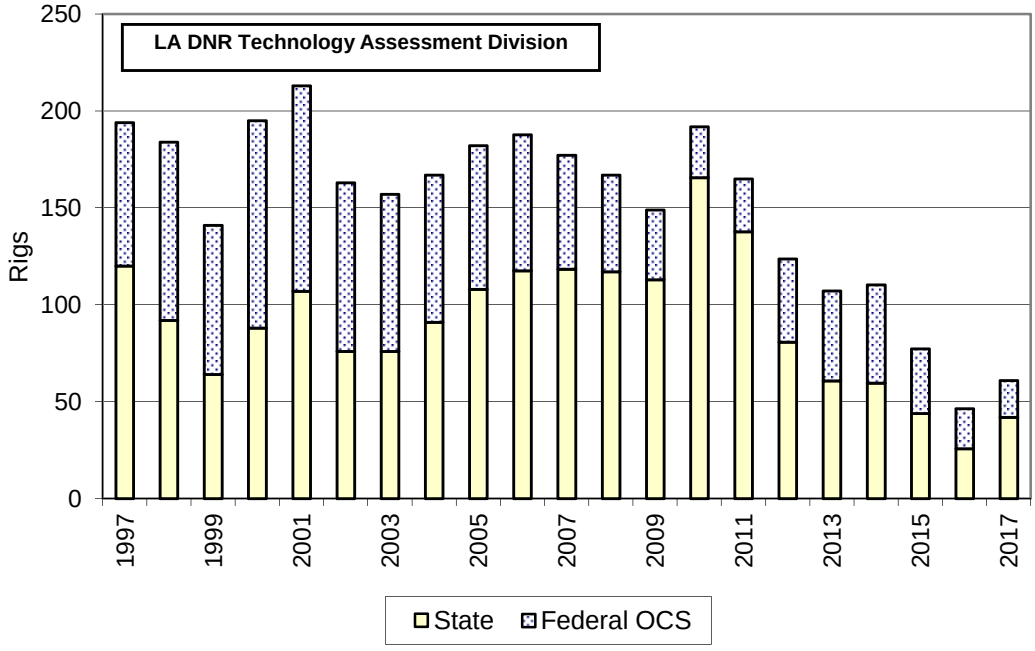


Table 23

LOUISIANA AVERAGE RIGS RUNNING

DATE	State North[4]	State South Inland		State Offshore	Total State	Federal Offshore	Total Offshore[4] (State+OCS)	LA[4] TOTAL
		Water[4]	Land[4]					
1997	21	23	48	28	120	74	102	193
1998	19	21	38	14	92	92	106	184
1999	16	16	21	12	65	76	89	141
2000	24	16	37	10	86	108	118	195
2001	30	20	44	10	105	109	119	214
2002	23	16	32	5	77	87	92	163
2003	29	14	29	4	76	81	85	157
2004	39	18	30	3	91	76	79	167
2005	48	23	32	4	108	74	79	182
2006	57	19	38	3	118	70	73	188
2007	58	24	34	2	118	59	61	177
2008	68	20	26	3	117	50	53	167
2009	89	8	15	1	113	36	38	150
2010	134	13	16	2	166	26	28	192
2011	97	17	22	2	138	28	29	165
2012	36	18	26	1	81	43	44	124
2013	24	20	15	2	61	47	49	108
2014	28	15	16	1	60	51	51	110
2015	28	5	11	0	44	33	33	77
January	24	1	7	0	32	23	23	55
February	18	1	5	0	24	23	23	47
March	17	3	5	0	25	24	24	49
April	15	4	5	0	24	23	23	47
May	15	4	4	0	23	22	22	45
June	15	4	6	0	25	20	20	45
July	16	4	6	0	26	19	19	44
August	15	4	7	0	26	16	16	42
September	15	4	4	0	23	17	17	40
October	17	2	6	0	25	21	21	46
November	22	2	6	0	30	21	21	51
December	23	1	3	1	28	20	21	48
2016 Average	**18**	**3**	**5**	**0**	**26**	**21**	**21**	**47**
January	24	1	5	1	31	20	22	51
February	28	3	4	1	36	16	17	52
March	30	4	2	1	38	17	18	55
April	33	3	3	1	40	19	19	59
May	37	4	2	0	43	20	20	63
June	39	4	1	0	44	21	21	65
July	43	3	2	0	48	22	22	70
August	43	3	4	0	50	16	16	66
September	42	4	3	0	49	17	17	66
October	42	1	2	0	19	19	19	64
November	39	1	3	0	18	18	18	60
December	39	2	4	0	18	18	18	63
2017 Average	**37**	**3**	**3**	**0**	**42**	**19**	**19**	**61**

e Estimated r Revised p Preliminary See footnote in Appendix B

Table 24

LOUISIANA STATE PRODUCING CRUDE OIL WELLS

Excluding OCS

DATE	NORTH	SOUTH	OFFSHORE	TOTAL
1972	12,475	8,912	1,048	22,436
1973	11,698	8,249	1,025	20,972
1974	11,984	8,262	985	21,230
1975	12,259	8,094	936	21,288
1976	12,393	7,730	1,073	21,196
1977	12,915	7,444	1,067	21,425
1978	13,019	7,219	1,086	21,324
1979	12,961	6,859	1,078	20,898
1980	13,981	6,832	1,073	21,885
1981	15,084	6,777	1,105	22,966
1982	15,540	6,608	1,112	23,259
1983	16,299	6,374	1,037	23,710
1984	17,544	6,300	1,038	24,882
1985	18,794	6,223	1,014	26,031
1986	19,346	6,061	1,001	26,408
1987	18,630	5,768	945	25,343
1988	17,953	5,698	964	24,615
1989	16,849	5,474	927	23,250
1990	17,369	5,215	906	23,490
1991	17,731	5,143	868	23,742
1992	17,449	5,155	842	23,446
1993	16,810	5,015	814	22,640
1994	15,904	4,682	805	21,392
1995	15,260	4,451	769	20,479
1996	15,148	4,295	719	20,163
1997	14,573	4,165	619	20,358
1998	13,975	3,962	546	18,484
1999	13,747	3,971	546	18,264
2000	16,795	3,914	408	21,117
2001	16,494	4,257	393	21,144
2002	16,531	4,071	423	21,026
2003	16,516	3,583	467	20,566
2004	16,148	3,485	462	20,095
2005	17,153	3,648	317	21,117
2006	17,072	3,615	241	20,928
2007	16,994	3,711	262	20,966
2008	N/A	N/A	N/A	21,146
2009	N/A	N/A	N/A	20,852
2010	N/A	N/A	N/A	20,007
2011	14,333	4,045	411	18,789
2012	14,217	4,275	436	18,928
2013	16,691	3,646	240	20,577
2014	12,557	3,156	228	16,941
2015	13,007	4,151	447	17,605
2016	12,908	3,743	477	17,128
2017	12,433	3,490	407	16,330

e Estimated r Revised p Preliminary See footnote in Appendix B

Figure 13

2016 Percentage of Louisiana Oil Wells by Production Rates

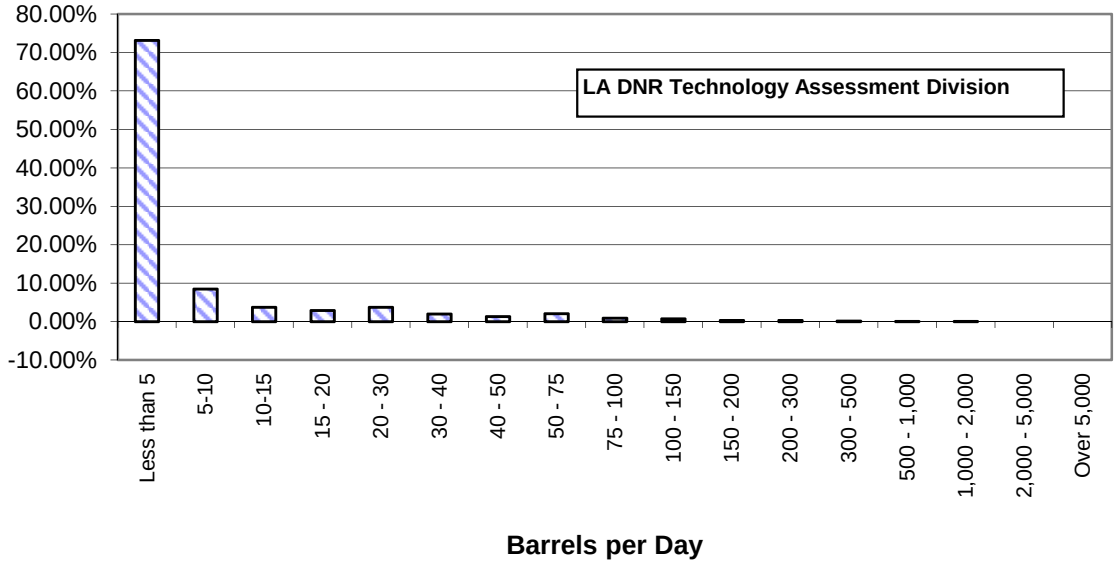


Figure 14

2016 Percentage of Louisiana Gas Wells by Production Rates

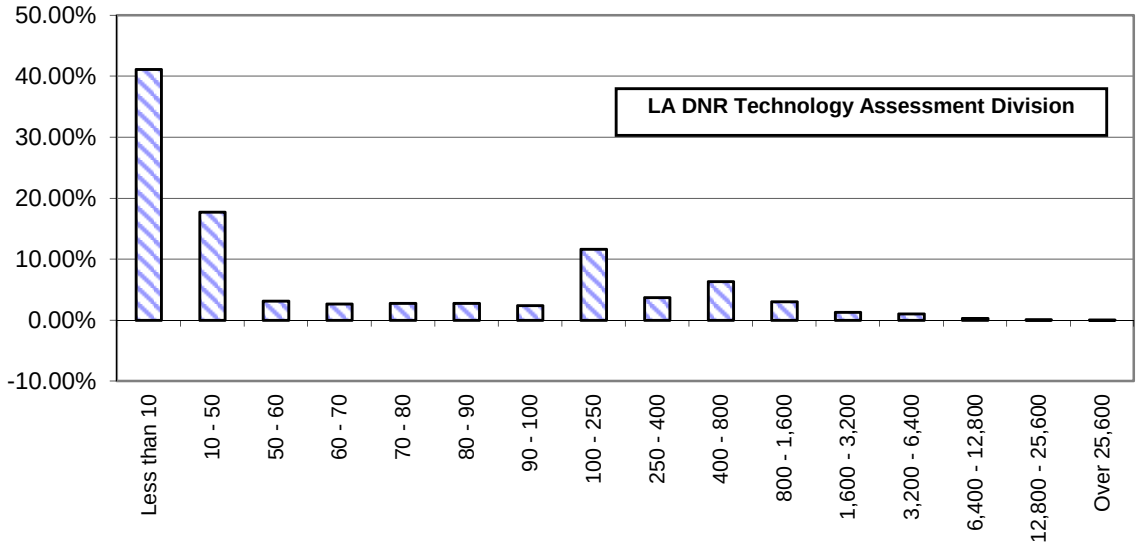


Table 25

LOUISIANA STATE PRODUCING NATURAL GAS WELLS

Excluding OCS

DATE	NORTH	SOUTH	OFFSHORE	TOTAL
1972	4,664	3,397	316	8,378
1973	4,927	3,449	332	8,707
1974	5,159	3,458	313	8,929
1975	5,373	3,331	308	9,012
1976	5,851	3,289	362	9,502
1977	6,343	3,331	449	10,123
1978	6,915	3,253	472	10,640
1979	7,372	3,214	514	11,100
1980	8,360	3,277	551	12,188
1981	9,479	3,226	557	13,262
1982	10,154	3,136	564	13,855
1983	10,502	3,065	549	14,115
1984	10,812	2,955	532	14,299
1985	11,026	2,887	511	14,424
1986	11,049	2,730	436	14,216
1987	10,726	2,635	413	13,774
1988	10,813	2,539	445	13,796
1989	10,861	2,474	501	13,836
1990	10,802	2,407	512	13,721
1991	10,702	2,261	496	13,459
1992	10,498	2,149	496	13,143
1993	10,506	2,192	490	13,189
1994	10,596	2,260	473	13,329
1995	10,452	2,200	335	12,987
1996	10,376	2,148	274	12,799
1997	10,446	2,149	296	12,891
1998	10,579	1,995	259	12,833
1999	10,581	2,010	262	12,853
2000	13,704	3,194	333	17,231
2001	13,054	3,369	311	16,734
2002	13,438	3,309	344	17,092
2003	13,607	2,952	384	16,944
2004	13,924	3,005	398	17,327
2005	13,996	2,977	258	17,231
2006	14,478	3,066	204	17,748
2007	14,707	3,211	227	18,145
2008	N/A	N/A	N/A	18,984
2009	N/A	N/A	N/A	19,009
2010	N/A	N/A	N/A	19,384
2011	18,542	1,851	159	20,552
2012	19,125	1,734	144	21,003
2013	18,184	1,295	104	19,583
2014	16,114	1,003	72	17,189
2015	19,273	1,424	87	20,784
2016	18,929	1,116	54	20,099
2017	19,054	989	53	20,096

e Estimated r Revised p Preliminary See footnote in Appendix B

Table 26

LOUISIANA STATE WELL COMPLETION BY TYPE AND BY REGION

Excluding OCS

	YEAR	OFFSHORE	SOUTH	NORTH	TOTAL
	2003	1	106	53	160
	2004	2	106	69	177
	2005	1	86	113	200
C	2006	4	137	164	305
R O	2007	3	125	149	277
U I	2008	5	101	228	334
D L	2009	1	63	90	154
E	2010	9	114	167	290
	2011	4	122	144	270
	2012	3	258	422	683
	2013	3	123	267	393
	2014	9	126	225	360
	2015	19	194	39	252
	2016	0	36	17	53
	2017	2	30	22	54
	2003	15	194	383	592
	2004	7	186	649	842
	2005	9	197	769	975
N	2006	6	190	826	1,022
A	2007	5	104	923	1,032
T G	2008	9	97	984	1,090
U A	2009	3	39	707	749
R S	2010	9	73	958	1,040
A	2011	4	37	198	239
L	2012	1	54	203	258
	2013	2	28	55	85
	2014	6	66	303	375
	2015	9	172	307	488
	2016	0	31	213	244
	2017	0	20	268	288
	2003	6	166	134	306
	2004	10	144	105	259
	2005	12	166	142	320
D H	2006	5	197	165	367
R O	2007	3	164	116	283
Y L	2008	4	94	121	219
E	2009	1	63	75	139
	2010	2	61	76	139
	2011	0	36	52	88
	2012	1	57	92	150
	2013	0	33	71	104
	2014	0	11	3	14
	2015	0	2	1	3
	2016	0	2	0	2
	2017	0	0	1	1

Table 27

LOUISIANA STATE MINERAL BONUS, RENTAL AND ROYALTY OVERRIDE REVENUES, Excluding OCS

(Million Dollars)

DATE	BONUSES	OVERRIDE ROYALTY	RENTALS	TOTAL
1997	38.27	0.84	25.00	64.11
1998	42.27	0.69	25.86	68.82
1999	14.17	0.45	20.27	34.89
2000	21.12	1.13	14.16	36.41
2001	29.70	1.89	13.75	45.34
2002	24.74	2.29	14.26	41.28
2003	19.54	3.36	12.93	35.83
2004	29.79	5.05	9.47	44.31
2005	35.78	2.03	13.75	51.56
2006	33.49	2.05	21.64	57.18
2007	45.91	3.35	22.59	71.85
2008	171.28	5.89	23.09	200.26
2009	17.70	4.26	25.13	47.09
2010	32.01	4.60	19.35	55.96
2011	19.48	8.42	16.36	44.27
2012	17.48	9.80	11.72	39.00
2013	18.92	11.31	11.14	41.38
2014	8.98	7.72	11.11	27.80
2015	4.25	-13.71	5.10	-4.36
January	0.04	0.14	0.37	0.56
February	0.51	0.20	0.10	0.81
March	0.05	1.17	0.18	1.40
April	0.14	0.20	0.09	0.43
May	0.21	0.92	0.04	1.17
June	0.03	0.22	0.48	0.73
July	0.06	0.09	0.44	0.59
August	0.01	0.94	0.14	1.08
September	0.12	0.20	0.50	0.82
October	0.01	0.20	0.17	0.38
November	0.13	1.06	0.37	1.56
December	0.31	0.38	0.10	0.79
2016 Total	**1.62**	**5.73**	**2.98**	**10.33**
January	0.05	0.24	0.19	0.48
February	0.02	0.42	0.19	0.63
March	0.37	0.18	0.12	0.67
April	0.03	0.11	0.05	0.19
May	0.17	-4.53	0.02	-4.34
June	0.08	4.77	0.03	4.88
July	1.71	-0.68	0.18	1.21
August	0.21	-0.02	0.08	0.27
September	0.01	0.08	0.22	0.31
October	0.00	0.33	0.15	0.48
November	0.28	0.17	0.00	0.45
December	0.60	0.10	0.17	0.87
2017 Total	**3.53**	**1.16**	**1.41**	**6.10**

e Estimated r Revised p Preliminary See footnote in Appendix B

Table 28

LOUISIANA STATE MINERAL ROYALTY REVENUE

Excluding OCS
(Million Dollars)

DATE	OIL	GAS	PLANT LIQUIDS	OTHER	TOTAL
1997	112.76	154.62	5.93	0.00	273.31
1998	68.85	121.17	2.58	0.00	192.60
1999	91.52	115.10	2.05	0.00	208.66
2000	145.80	212.71	3.46	0.00	361.97
2001	122.16	252.68	6.33	0.00	381.17
2002	100.10	165.24	8.03	0.00	273.37
2003	127.61	288.91	9.31	0.00	425.83
2004	143.84	274.64	14.82	0.00	433.30
2005	149.97	279.03	10.51	0.00	439.50
2006	201.71	287.24	14.23	0.00	503.19
2007	288.57	305.62	18.98	0.00	613.18
2008	372.30	419.94	32.16	0.00	824.41
2009	210.54	153.86	14.91	0.00	379.31
2010	272.57	162.50	22.52	0.00	457.59
2011	381.35	173.52	32.48	0.00	587.34
2012	376.98	121.89	24.78	0.00	523.64 r
2013	382.37	158.56	27.85	0.00	568.79 r
2014	320.26	166.82	23.74	0.00	510.83 r
2015	147.13	86.73	8.03	0.00	241.89 r
January	6.15	5.36	0.42	0.00	11.93 r
February	6.12	4.25	0.41	0.00	10.78 r
March	7.95	3.64	0.59	0.00	12.18 r
April	8.89	4.00	0.53	0.00	13.43 r
May	10.22	4.13	0.59	0.00	14.94 r
June	10.64	5.11	0.63	0.00	16.39 r
July	9.66	6.34	0.58	0.00	16.59 r
August	9.41	5.80	0.54	0.00	15.75 r
September	8.90	6.11	0.55	0.00	15.56 r
October	10.23	6.01	0.65	0.00	16.90 r
November	7.93	4.97	0.58	0.00	13.48 r
December	8.58	6.95	0.73	0.00	16.26 r
2016 Total	**104.70**	**62.67**	**6.80**	**0.00**	**174.17** r
January	10.05	7.10	0.62	0.00	17.77
February	9.09	5.32	0.64	0.00	15.05
March	8.98	5.34	0.58	0.00	14.90
April	9.46	5.10	0.51	0.00	15.07
May	9.56	5.80	0.58	0.00	15.94
June	7.89	5.29	0.51	0.00	13.69
July	8.75	5.13	0.64	0.00	14.52
August	8.65	5.22 e	0.48	0.00	11.58
September	8.55 e	4.95 e	0.42 e	0.00	13.92 e
October	9.01 e	5.17 e	0.54 e	0.00	14.72 e
November	8.83 e	5.02 e	0.51 e	0.00	14.36 e
December	9.12 e	5.22 e	0.60 e	0.00	14.94 e
2017 Total	**107.94**	**64.65**	**6.63**	**0.00**	**176.45**

Table 29

LOUISIANA STATE MINERAL SEVERANCE TAX REVENUE [8]

Excluding OCS
(Million Dollars)

DATE	OIL	GAS	OTHER MINERALS	SEVERANCE TOTAL
1997	257.13	118.27	1.85	377.25
1998	148.96	120.98	1.40	271.34
1999	171.29	102.48	1.82	275.60
2000	337.51	104.32	1.50	443.33
2001	281.95	165.77	1.65	449.38
2002	235.84	173.51	1.33	410.67
2003	316.70	152.13	1.70	470.53
2004	359.77	216.73	1.73	578.23
2005	439.00	243.62	1.61	681.50
2006	506.31	331.40	1.69	839.41
2007	529.75	354.11	1.67	885.52
2008	842.94	293.66	1.65	1138.25
2009	377.51	292.18	1.63	671.32
2010	516.90	224.18	1.58	742.67
2011	677.56	97.61	1.34	776.51
2012	736.78	135.23	1.31	873.32
2013	761.75	99.45	1.38	862.58
2014	685.68	147.70	1.24	834.61
2015	358.96	190.30	1.46	550.72
January	20.75	13.02	0.12	33.89
February	19.38	9.64	0.09	29.11
March	16.80	7.23	0.07	24.10
April	16.19	18.26	0.05	34.50
May	16.94	11.89	0.17	29.00
June	21.84	14.04	0.15	36.03
July	21.24	9.74	0.12	31.11
August	18.86	12.22	0.10	31.19
September	17.75	2.33	0.20	20.29
October	22.20	13.32	0.11	35.63
November	21.11	7.10	0.13	28.34
December	25.19	6.80	0.14	32.13
2016 Total	**238.26**	**125.61**	**1.45**	**365.31**
January	20.24	6.80	0.11	27.16
February	23.72	9.31	0.10	33.12
March	24.54	6.70	0.11	31.34
April	16.99	7.52	0.06	24.56
May	28.07	6.46	0.09	34.61
June	17.73	11.93	0.15	29.80
July	26.12	8.80	0.07	35.00
August	20.77	8.61	0.09	29.47
September	22.86	10.67	0.06	33.59
October	21.09	11.73	0.07	32.88
November	21.60	9.10	0.13	30.83
December				
2017 Total	**222.12**	**88.51**	**0.89**	**311.52**

e Estimated r Revised p Preliminary See footnote in Appendix B

Table 30

STATE REVENUE FROM LOUISIANA'S OUTER CONTINENTAL SHELF [13]

(Dollars)

YEAR	RENTALS	BONUSES	ROYALTIES	OTHERS REVENUE	GOMESA	TOTAL
1987	148,578	3,150,519	11,043,115	574,520,000		588,862,212
1988	153,561	5,528,006	8,708,079	2,520,000		16,909,646
1989	175,817	2,890,298	7,163,105	2,520,000		12,749,220
1990	430,198	5,570,375	6,239,368	2,520,000		14,759,941
1991	303,824	2,220,094	8,461,261	2,520,000		13,505,179
1992	258,787	1,189,989	6,405,279	5,880,000		13,734,055
1993	235,250	965,504	7,373,550	5,880,000		14,454,304
1994	1,016,932	1,913,682	11,780,932	5,880,000		20,591,546
1995	255,213	890,002	8,012,718	5,880,000		15,037,933
1996	292,445	4,666,400	12,283,395	5,880,000		23,122,240
1997	686,051	5,689,689	11,855,454	8,400,000		26,631,194
1998	412,229	1,744,928	9,621,860	8,400,000		20,179,017
1999	357,379	241,659	6,284,879	8,400,000		15,283,917
2000	321,695	1,268,244	12,690,937	15,254,978		22,680,876
2001	303,675	2,148,111	30,454,058	7,735,941		40,641,785
2002	94,841	0	11,768,383	28,363		11,891,587
2003	284,563	2,842,662	26,447,045	21,775		29,596,045
2004	490,745	7,620,500	30,145,237	6,613		38,256,482
2005	374,717	2,521,931	27,995,948	7,849		30,900,445
2006	494,362	5,947,411	24,325,787	1,304,257		32,071,817
2007	196,129	-2,695,489	25,498,932	89,134		23,088,706
2008	412,813	6,196,386	36,547,175	2,607,022		45,763,396
2009	339,802	463,332	21,433,896	80,201	6,347,321	28,664,552
2010	355,697	2,892,749	19,321,141	35,844	699,757	23,305,188
2011	268,106	0	20,325,825	93,441	222,725	20,910,097
2012	N/A	N/A	N/A	N/A	80,770	19,845,947
2013	N/A	N/A	N/A	N/A	75,621	24,533,076
2014	N/A	N/A	N/A	N/A	1,119,942	20,586,591
2015	N/A	N/A	N/A	N/A	653,383	12,579,284
2016	N/A	N/A	N/A	N/A	82,196	6,395,879
2017	N/A	N/A	N/A	N/A	N/A	N/A

e Estimated r Revised p Preliminary See footnote in Appendix B

2017 Information not available at the time of writing

Table 31

LOUISIANA STATE TOTAL MINERAL REVENUE

(Dollars)

YEAR	FEDERAL OCS[13]	FEDERAL ONSHORE[13]	STATE BOUNDARIES	TOTAL
1987	588,862,212	517,000	746,675,897	1,336,055,109
1988	16,909,646	545,000	660,959,699	678,414,345
1989	12,749,220	452,000	678,301,987	691,503,207
1990	14,759,941	542,000	779,963,703	795,265,644
1991	13,505,179	328,000	751,117,246	764,950,425
1992	13,734,055	376,000	680,527,788	694,637,843
1993	14,454,304	782,000	639,182,812	654,412,032
1994	20,591,546	532,000	560,371,998	581,495,544
1995	15,037,933	728,000	638,942,698	654,708,631
1996	23,122,240	943,209	770,137,601	794,203,050
1997	26,631,194	817,329	714,672,685	742,121,208
1998	20,179,017	996,000	532,755,940	553,930,957
1999	15,283,917	1,276,465	519,144,200	535,704,582
2000	22,680,876	1,024,730	839,883,694	863,589,300
2001	40,641,785	1,481,176	875,887,102	918,010,063
2002	11,891,587	730,156	725,323,377	737,945,120
2003	29,596,045	1,182,451	932,191,569	962,970,065
2004	38,256,482	1,364,965	1,055,838,962	1,095,460,408
2005	30,900,445	1,569,882	1,166,491,860	1,198,962,188
2006	32,071,817	1,170,670	1,395,971,977	1,429,214,465
2007	23,088,706	940,888	1,545,321,941	1,569,351,535
2008	45,763,396	3,703,240	2,162,918,035	2,212,384,671
2009	28,664,552	914,421	1,097,717,147	1,127,296,119
2010	23,305,188	3,123,211	1,256,220,286	1,282,648,686
2011	20,910,097	17,982,455	1,408,117,556	1,447,010,108
2012	19,845,947	6,914,439	1,436,769,322	1,463,529,708
2013	24,533,076	2,607,490	1,472,614,331	1,499,754,898
2014	20,586,591	3,417,220	1,371,527,259	1,395,531,070
2015	12,579,284	1,734,869	786,918,399 e	801,232,552 e
2016	6,395,879	904,498	427,201,887 e	434,502,264 e
2017	N/A	N/A	N/A	N/A

e Estimated r Revised p Preliminary See footnote in Appendix B

Federal OCS: See footnotes on Appendix B "OCSLA" & "GOMESA"

Federal Onshore: Revenue distributed to the state under section 35 of the Mineral Leasing Act (MLA). MLA provides to the state 50% of mineral revenue from federal lands located within the state boundaries. Revenues came from royalties, rents and bonuses. It is fiscal year data. Oil and gas produced on federal onshore pay severance tax to the state by the producer on the non-royalty share of the production, and the royalty share of the production is exempted.

State Boundaries: Revenue from mineral production such as bonuses, override royalties, rents, royalties and severance taxes within state boundaries.

Table 32

REVENUE TO FEDERAL GOVERNMENT COLLECTED FROM OIL AND GAS LEASES IN THE LOUISIANA OUTER CONTINENTAL SHELF [12]

(Area beyond the state's 3-mile offshore boundary)
(Dollars)

YEAR	BONUS PAYMENTS	RENTAL PAYMENTS	OTHER REVENUES	PRODUCTION ROYALTIES	TOTAL[a] COLLECTION
1981	3,308,009,881	8,205,515	1,211,959	2,825,271,285	6,142,698,640
1982	1,110,172,751	7,288,316	1,349,850	3,166,294,042	4,285,104,959
1983	3,796,644,766	13,620,158	2,540,294	2,764,348,600	6,577,153,818
1984	1,154,495,009	16,323,567	2,010,462	3,195,995,282	4,368,824,320
1985	830,710,260	33,756,447	2,139,530	2,940,519,737	3,807,125,974
1986	113,731,609	34,110,029	3,199,547	2,006,205,199	2,157,246,384
1987	247,344,486	52,115,828	19,239,027	1,803,208,740	2,121,908,081
1988	388,730,457	35,752,757	8,727,373	1,571,981,500	2,005,192,087
1989	386,710,637	48,498,402	26,261,190	1,618,163,065	2,079,633,294
1990	421,375,632	55,568,777	16,028,740	2,068,487,831	2,561,460,980
1991	276,234,849	59,126,732	15,444,167	1,857,392,914	2,208,198,662
1992	53,716,797	49,087,621	33,533,897	1,848,599,157	1,984,937,472
1993	61,454,861	29,268,366	119,445,091	2,009,644,653	2,219,812,971
1994	256,271,643	30,003,884	141,190,812	1,888,953,102	2,316,419,441
1995	296,254,733	62,526,069	19,803,444	1,764,875,791	2,143,460,037
1996	24,330,068	53,231,380	40,394,227	2,549,759,516	3,154,940,691
1997	1,169,790	55,761,920	65,651,370	2,857,126,443	3,789,383,151
1998	9,207,972	51,518,286	-14,452,431	2,267,502,514	2,313,776,341
1999	1,169,790	40,463,226	49,219,184	2,228,250,265	2,319,102,465
2000	83,630,219	32,710,256	167,647,231	3,045,847,943	3,329,835,649
2001	160,037,859	30,078,009	177,773,259	5,126,344,201	5,494,233,328
			GULF OF MEXICO TOTAL		
2001	632,482,979	188,455,045	3,126,962	6,674,371,634	7,498,436,619
2002	138,423,162	153,303,576	3,252,702	3,841,164,517	4,136,143,958
2003	1,147,014,322	245,963,859	4,983,819	4,535,938,009	5,933,900,009
2004	523,416,154	214,303,045	2,570,343	4,607,776,092	5,348,065,634
2005	518,426,651	221,784,370	1,897,501	5,313,350,455	6,055,458,976
2006	865,262,735	224,006,816	2,839,550	6,514,658,836	7,606,767,938
2007	373,930,998	200,993,255	3,166,689	6,441,214,179	7,019,305,120
2008	6,818,747,137	231,026,391	3,105,849	7,850,622,155	14,903,501,532
2009	1,181,075,491	226,229,847	3,013,594	4,161,415,445	5,571,734,377
2010	979,569,294	236,631,251	-3,531,170	3,743,286,144	4,955,955,519
2011	36,751,111	219,119,868	2,153,134	5,960,501,525	6,218,525,638
2012	663,714,729	217,669,757	31,841,893	5,626,212,490	6,539,438,869
2013	2,675,653,773	244,699,154	34,646,396	5,778,759,396	8,733,758,719
2014	967,365,328	229,741,396	46,262,768	5,846,709,902	7,090,079,394
2015	642,044,899	215,683,828	-36,545,638	4,109,252,603	4,930,435,692
2016	155,161,660	159,864,463	-4,001,659	2,435,585,537	2,746,610,002

[a] Total collection, including state 8G shares.

e Estimated r Revised p Preliminary See footnote in Appendix B

2017 Information not available at the time of writing

Table 33

LOUISIANA ESTIMATED CRUDE OIL PROVED RESERVES [9]
EXCLUDING LEASE CONDENSATE
As of December 31st of Each Year
(Million Barrels)

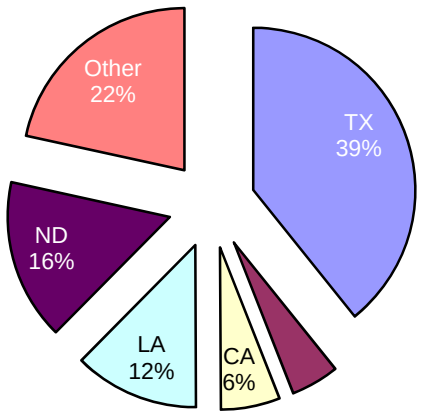
YEAR	North	South Onshore	South Offshore	Federal OCS	Total Louisiana	TOTAL US
1995	108	387	142	2,269	2,906	22,351
1996	128	382	148	2,357	3,015	22,017
1997	136	427	151	2,587	3,301	22,546
1998	101	357	97	2,483	3,038	21,034
1999	108	384	108	2,442	3,042	21,765
2000	97	310	122	2,751	3,280	22,045
2001	87	341	136	3,877	4,441	22,446
2002	75	335	91	4,088	4,589	22,677
2003	66	314	72	4,251	4,703	21,891
2004	58	304	65	3,919	4,346	21,371
2005	68	299	65	3,852	4,284	21,757
2006	68	312	48	3,500	3,928	20,972
2007	76	326	56	3,320	3,778	21,317
2008	60	277	51	3,388	3,776	19,121
2009	55	269	46	3,570	3,940	20,682
2010	104	274	46	3,914	4,338	23,267
2011	103	264	50	4,438	4,855	26,544
2012	100	300	63	4,504	4,967	30,529
2013	120	328	55	4,503	5,006	33,371
2014	118	349	67	4,244	4,778	36,385
2015	89	276	59	3,825	4,249	32,318
2016	71	283	54	3,678	4,086	32,773

e Estimated r Revised p Preliminary See footnote in Appendix B

Figure 15

UNITED STATES
CRUDE OIL
RESERVES
December 31, 2016
Excluding Lease Condensate
(Million Barrels)

STATE	VOLUME
Texas	12,859
Alaska	1,572
California	1,933
Louisiana	4,086
N. Dakota	5,256
Other	7,067
TOTAL	**32,773**



LA DNR Technology Assessment Division

Table 34

LOUISIANA ESTIMATED LEASE CONDENSATE PROVED RESERVES[9]

As of December 31st of Each Year
(Million Barrels)

YEAR	North	South Onshore	South Offshore	Federal OCS	Total Louisiana	TOTAL US
1996	24	127	11	422	584	1,307
1997	30	134	12	433	609	1,341
1998	23	138	16	435	612	1,336
1999	25	134	15	435	609	1,295
2000	22	130	17	437	606	1,333
2001	27	141	19	325	512	1,398
2002	19	107	11	300	437	1,346
2003	19	82	11	251	363	1,215
2004	21	66	9	205	301	1,221
2005	23	72	9	228	332	1,218
2006	29	65	10	185	289	1,339
2007	31	69	11	180	291	1,415
2008	27	64	8	151	250	1,433
2009	26	74	10	134	244	1,633
2010	27	68	11	129	235	1,914
2011	33	64	11	129	237	2,406
2012	38	70	13	98	219	2,874
2013	39	68	12	88	207	3,149
2014	48	56	11	108	223	3,548
2015	46	59	5	122	232	2,912
2016	33	50	4	149	236	2,440

e Estimated r Revised p Preliminary See footnote in Appendix B

Figure 16

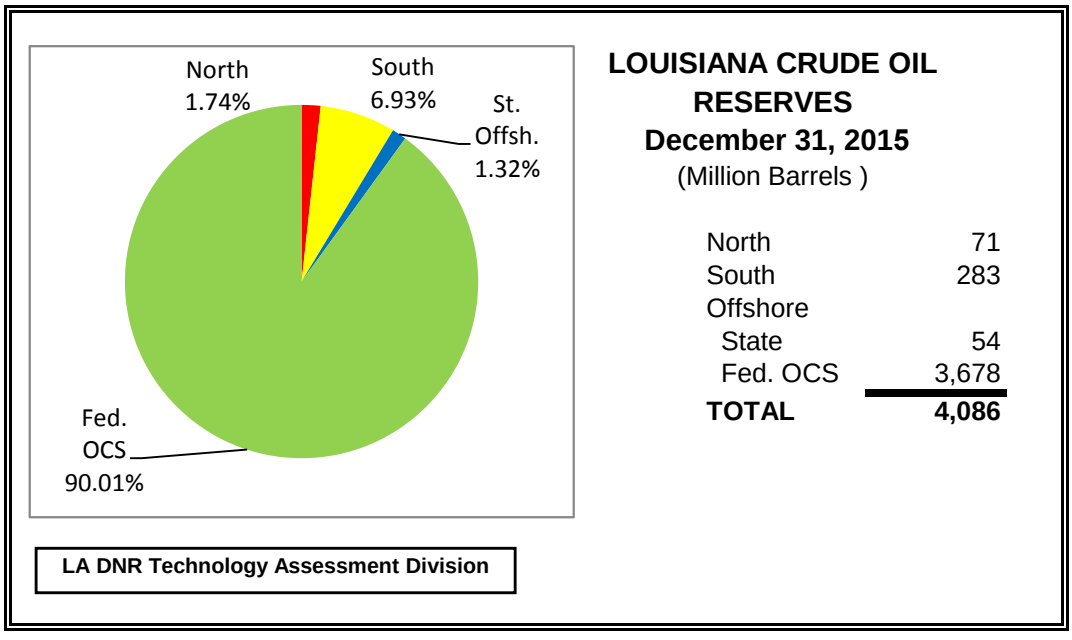


Table 35

LOUISIANA ESTIMATED DRY NATURAL GAS PROVED RESERVES[9]

As of December 31st of Each Year

(Billion Cubic Feet, at 14.73 psia and 60 degrees Fahrenheit)

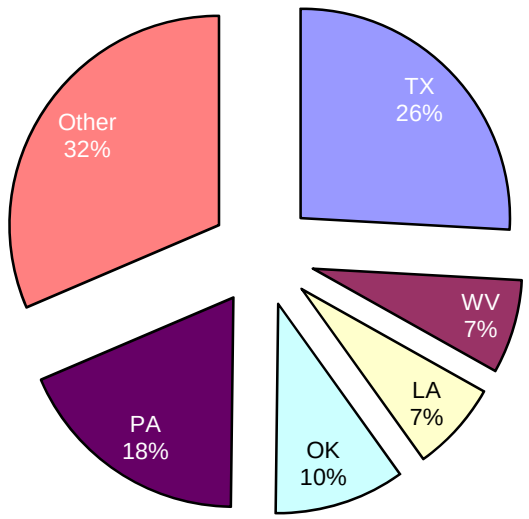
YEAR	North	South Onshore	South Offshore	Federal OCS	Total Louisiana	TOTAL US
1995	2,788	5,648	838	21,392 c	30,666 c	165,146
1996	3,105	5,704	734	21,856 c	31,399 c	166,474
1997	3,093	5,855	725	21,934 c	31,607 c	167,223
1998	2,898	5,698	551	20,774 c	29,921 c	164,041
1999	3,079	5,535	628	19,598 c	28,840 c	167,406
2000	3,298	5,245	696	19,788 c	29,027 c	177,427
2001	3,881	5,185	745	19,721 c	29,532 c	183,460
2002	4,245	4,224	491	18,500 c	27,460 c	186,946
2003	5,074	3,746	506	16,728 c	26,054 c	189,044
2004	5,770	3,436	382	14,685 c	24,273 c	192,513
2005	6,695	3,334	418	13,665 c	24,112 c	204,385
2006	6,715	3,335	424	11,824 c	22,298 c	211,085
2007	6,344	3,323	378	11,090 c	21,135 c	237,726
2008	7,876	2,799	898	10,450 c	22,023 c	244,656
2009	17,146	2,844	701	9,362 c	30,053 c	272,509
2010	26,030	2,876	371	8,896 c	38,173 c	304,625
2011	27,337	2,519	502	8,156 c	38,514 c	334,067
2012	18,418	3,029	502	7,291 c	29,240 c	308,036
2013	17,044	2,718	402	6,482 c	26,646 c	328,264
2014	19,722	2,926	327	6,890 c	29,865 c	368,704
2015	13,593	2,279	225	5,909 c	22,006 c	307,730
2016	15,762	1,958	352	5,722 c	23,794 c	341,133

[C] Includes Federal Offshore Alabama

UNITED STATES NATURAL GAS RESERVES

(Billion Cubic Feet)

STATE	VOLUME
Texas	88,312
West Virginia	24,745
Louisiana	23,794
Oklahoma	34,396
Pennsylvania	62,656
Other	107,230
TOTAL	**341,133**



LA DNR Technology Assessment Division

Table 36

LOUISIANA ESTIMATED NATURAL GAS PLANT LIQUIDS IN TOTAL NATURAL GAS PROVED RESERVES[9]

As of December 31st of Each Year
(Million Barrels)

YEAR	North	South Onshore	South Offshore	Federal OCS	Total Louisiana	TOTAL US
1996	61	284	36	199 c	580 c	6,516
1997	50	199	12	352 c	613 c	6,632
1998	34	187	13	341 c	575 c	6,188
1999	36	222	23	403 c	684 c	6,503
2000	35	178	28	487 c	728 c	6,873
2001	35	128	41	460 c	664 c	6,595
2002	30	119	37	483 c	669 c	6,648
2003	48	100	35	347 c	530 c	6,244
2004	53	87	27	410 c	577 c	6,707
2005	57	103	31	407 c	598 c	6,903
2006	60	94	22	390 c	566 c	7,133
2007	69	97	25	365 c	556 c	7,648
2008	68	78	55	313 c	514 c	7,842
2009	98	90	43	301 c	532 c	8,557
2010	79	113	24	340 c	556 c	9,809
2011	54	94	44	354 c	546 c	10,825
2012	35	134	20	369 c	558 c	10,777
2013	52	144	16	292 c	504 c	11,943
2014	83	145	15	367 c	610 c	15,029
2015	75	127	16	292 c	510 c	12,757
2016	102	152	11	268 c	533 c	14,753

e Estimated r Revised p Preliminary See footnote in Appendix B

Figure 18

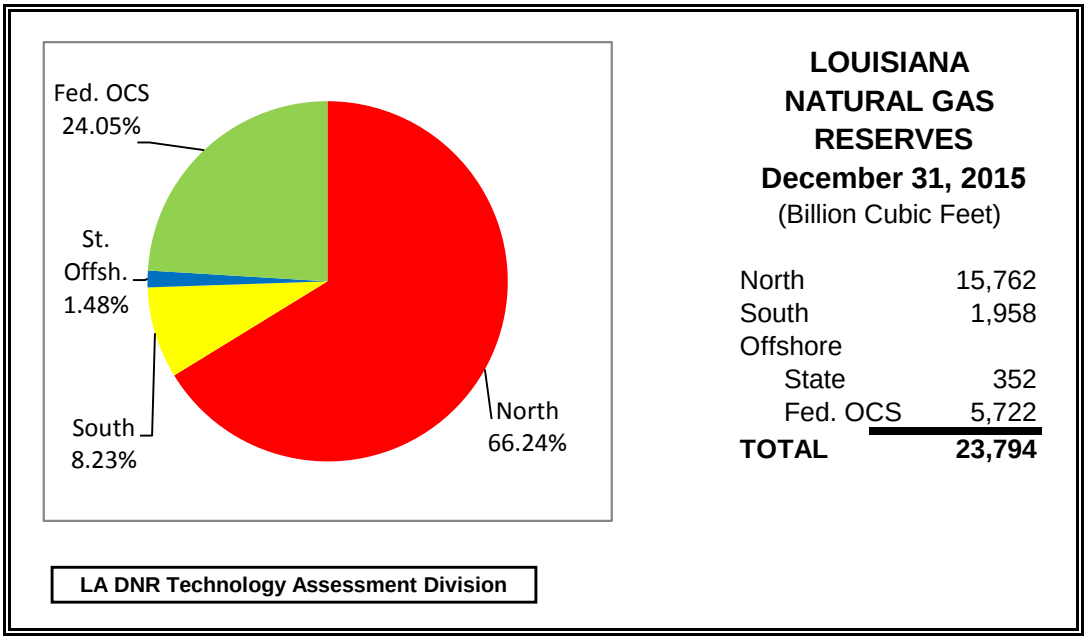


Table 37

LOUISIANA NONAGRICULTURAL EMPLOYMENT[1]

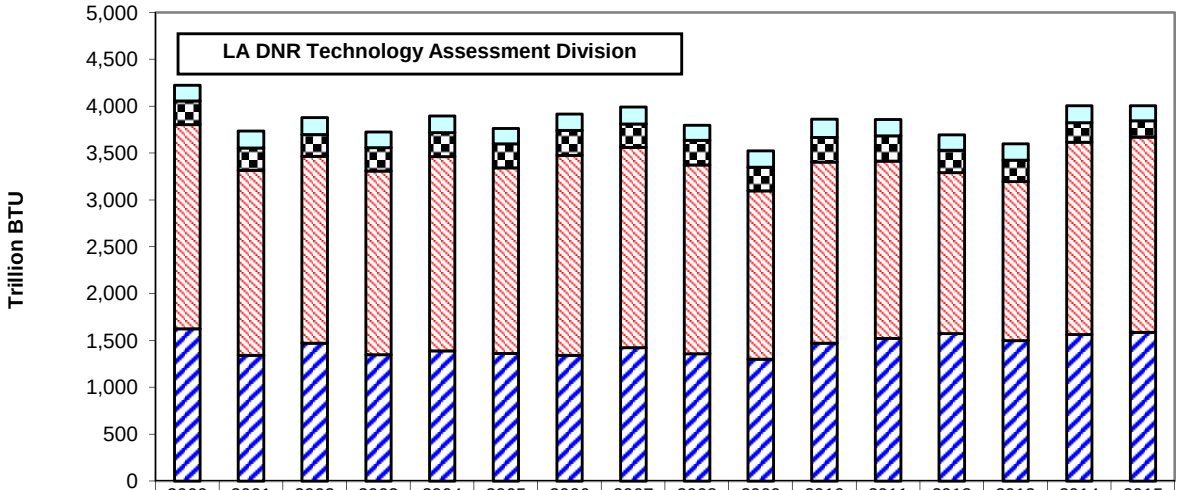
DATE	OIL & GAS PRODUCTION	CHEMICAL INDUSTRY	PETROLEUM MANUFACTURING	ALL PIPELINE*	TOTAL EMPLOYMENT
1997	51,559	29,935	11,038	792	1,797,225
1998	54,875	30,196	10,984	702	1,837,505
1999	44,645	28,898	11,046	693	1,846,026
2000	45,714	28,335	10,345	724	1,872,494
2001	47,009	27,337	10,643	2,417	1,868,902
2002	43,839	25,694	10,566	2,306	1,848,656
2003	42,339	24,558	10,395	2,334	1,851,570
2004	40,249	23,516	9,958	2,122	1,866,870
2005	41,179	23,269	10,240	2,179	1,843,237
2006	44,394	22,188	10,310	2,347	1,810,667
2007	46,764	22,612	10,764	2,454	1,869,965
2008	49,990	22,772	11,225	2,543	1,889,138
2009	47,500	22,529	11,356	2,463	1,856,385
2010	47,916	22,533	11,423	2,667	1,833,888
2011	49,239	23,168	11,163	2,778	1,846,761
2012	50,963	23,029	11,276	2,862	1,868,317
2013	50,242	23,345	11,575	2,857	1,891,851
2014	50,032	24,086	11,982	2,976	1,922,947
January	48,552	24,848	11,970	3,181	1,918,689
February	46,358	24,879	11,994	3,153	1,923,772
March	45,067	24,668	11,472	3,176	1,925,841
April	44,957	24,813	11,962	3,114	1,933,532
May	44,631	24,794	12,008	3,136	1,940,858
June	43,546	24,959	12,193	3,161	1,930,179
July	43,589	25,072	12,171	3,160	1,910,770
August	43,392	25,205	12,275	3,135	1,923,657
September	42,169	25,089	12,135	3,068	1,924,689
October	40,799	25,206	12,084	3,039	1,945,024
November	39,640	25,375	12,141	3,059	1,942,415
December	39,208	25,387	12,167	3,084	1,938,377
2015 Average	**43,492**	**25,025**	**12,048**	**3,122**	**1,929,817**
January	38,205	25,534	11,806	2,743	1,904,434
February	37,029	25,697	11,790	2,755	1,906,615
March	36,112	25,736	11,762	2,762	1,911,536
April	34,767	25,428	11,739	2,760	1,917,151
May	34,074	25,373	11,721	2,745	1,920,322
June	33,859	25,522	11,790	2,733	1,905,498
July	34,001	25,632	11,821	2,737	1,888,289
August	33,416	25,618	11,839	2,752	1,892,685
September	33,097	25,489	11,769	2,756	1,908,949
October	32,981	25,399	11,787	2,578	1,917,916
November	32,472	25,416	11,763	2,591	1,920,343
December	31,933	25,494	11,830	2,575	1,911,903
2016 Average	**34,329**	**25,528**	**11,785**	**2,707**	**1,908,803**

* Natural Gas Pipeline employment is included in 2001 forward but excluded in prior years.

e Estimated r Revised p Preliminary See footnote in Appendix B

Figure 19

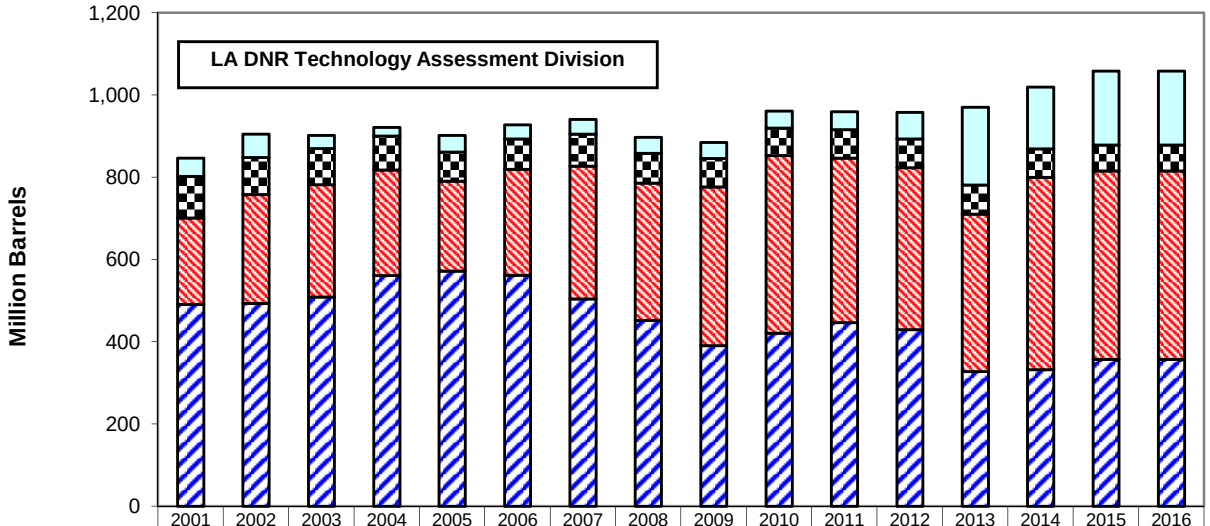
LOUISIANA ENERGY CONSUMPTION BY SOURCE



	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Nuclear	165	181	181	168	178	164	175	179	161	176	195	174	164	177	181	160
Coal	253	240	232	248	257	254	265	250	263	253	260	270	239	228	210	174
Petroleum	2,179	1,975	1,996	1,960	2,072	1,982	2,135	2,139	2,015	1,795	1,936	1,891	1,716	1,695	2,052	2,083
Natural Gas	1,626	1,342	1,471	1,349	1,390	1,363	1,342	1,424	1,360	1,303	1,471	1,525	1,576	1,501	1,564	1,589
Total	4,551	4,009	4,145	3,986	4,190	4,029	4,234	4,286	4,039	3,773	4,077	4,059	3,899	3,835	4,279	4,261

Figure 20

LOUISIANA REFINERY CRUDE OIL INPUT BY SOURCE



	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Other States	45	57	32	20	40	34	36	39	39	41	44	65	189	150	180	180
Louisiana	101	90	88	82	71	74	78	72	69	67	69	70	71	69	63	63
Federal OCS	210	265	273	257	219	257	323	334	386	432	400	394	383	468	458	458
Foreign	491	493	509	561	572	562	504	452	391	421	447	429	328	332	357	357
Total	847	905	902	921	902	928	941	896	885	967	960	958	970	1,019	1,058	1,058

Table 38

LOUISIANA ENERGY CONSUMPTION ESTIMATES BY SOURCE[11]

Year	Total Energy (TBTU)	Total Natural Gas (BCF)	Total Petroleum (MBBLS)	Total Coal (MST)	Total Nuclear (Million KWH)	Hydroelectric Power (Million KWH)
1975	3,113	1,789	230,872	0	0	0
1976	3,542	2,044	260,930	0	0	0
1977	3,943	2,191	299,549	79	0	0
1978	4,102	2,249	312,231	172	0	0
1979	4,051	1,978	351,467	118	0	0
1980	3,914	1,794	345,640	111	0	0
1981	3,970	1,782	351,404	1,363	0	0
1982	3,648	1,556	329,383	3,724	0	0
1983	3,443	1,413	307,978	6,154	0	0
1984	3,584	1,594	283,675	6,855	0	0
1985	3,349	1,386	280,304	9,217	2,457	0
1986	3,507	1,439	292,730	10,459	10,637	0
1987	3,569	1,501	286,809	10,391	12,324	0
1988	3,607	1,446	300,896	12,848	13,785	0
1989	3,764	1,556	297,765	12,471	12,391	0
1990	3,858	1,588	304,516	12,547	14,197	656
1991	3,847	1,525	312,517	12,965	13,956	656
1992	3,966	1,551	329,450	13,674	10,356	656
1993	4,034	1,579	334,556	13,676	14,398	1232
1994	4,170	1,586	358,274	14,100	12,779	972
1995	4,210	1,679	350,162	13,357	15,686	952
1996	4,389	1,616	374,722	12,534	15,765	964
1997	4,496	1,661	361,782	13,874	13,511	1,036
1998	4,227	1,569	348,208	13,891	16,428	1,063
1999	4,227	1,495	381,195	13,953	13,112	802
2000	4,551	1,537	428,363	15,737	15,796	532
2001	4,009	1,307	377,607	14,934	17,336	732
2002	4,145	1,426	383,119	14,676	17,305	891
2003	3,986	1,308	363,307	15,592	16,126	892
2004	4,190	1,346	384,677	16,059	17,080	1,099
2005	4,029	1,214	366,578	15,856	15,676	811
2006	4,234	1,297	396,178	16,410	16,735	713
2007	4,286	1,384	396,182	15,524	17,078	827
2008	4,039	1,324	430,005	16,409	15,371	1,064
2009	3,773	1,278	416,905	15,736	16,782	1,236
2010	4,077	1,448	449,440	16,240	18,639	1,109
2011	4,059	1,508	449,334	16,792	16,615	1,044
2012	3,899	1,563	428,594	14,893	15,659	680
2013	3,835	1,479	434,052	13,933	16,954	1,045
2014	4,279	1,507	432,067	12,821	17,311	1,090
2015	4,242	1,551	441,102	11,016	15,301	999

e Estimated r Revised p Preliminary See footnote in Appendix B

TBTU = Trillion BTU BCF = Billion Cubic Feet KWH = Kilowatt-hours

MBBLS = Thousand Barrels MST = Thousand Short Tons

Table 39

LOUISIANA REFINERY CRUDE OIL STATISTICS

DATE	AVERAGE STOCK ON HAND (Barrels)	DAILY AVERAGE RUNS TO STILL (Barrels)	LICENSED REFINERIES
1997	14,275,221	2,257,275	19
1998	14,965,117	2,312,239	19
1999	15,467,674	2,414,781	17
2000	14,818,774	2,334,842	16
2001	15,425,670	2,480,357	17
2002	16,335,210	2,470,556	18
2003	15,246,004	2,469,756	17
2004	15,938,390	2,543,087	18
2005	16,217,856	2,458,189	18
2006	16,741,544	2,528,319	17
2007	16,108,022	2,687,658	17
2008	16,248,826	2,440,984	18
2009	13,019,604	2,412,848	19
2010	14,183,752	2,632,282	19
2011	13,473,779	2,743,681	19
2012	13,596,335	2,754,173	18
2013	14,611,002	2,750,860	18
2014	14,160,947	2,831,181	17 r
January	14,680,493	2,886,971	18 r
February	15,056,906	3,049,115	18 r
March	14,444,181	2,951,173	18 r
April	13,832,535	3,014,031	18 r
May	13,916,983	3,047,211	18 r
June	15,037,677	3,017,772	18 r
July	14,149,815	2,916,164	18 r
August	15,032,705	2,885,244	18 r
September	14,772,091	2,957,126	18 r
October	15,453,689	2,722,814	18 r
November	15,882,929	2,959,723	18
December	13,595,674	3,088,516	18
2016 Average	**14,654,640**	**2,957,988**	**18 r**
January	13,688,928	2,814,044	18
February	14,483,940	2,822,594	18
March	15,288,914	2,942,408	18
April	15,564,060	3,002,646	18
May	14,183,839	3,098,652	18
June	14,411,473	3,070,741	18
July	15,115,617	3,135,103	18
August	12,728,138	3,054,049	18
September	15,188,018	3,215,523	18
October	15,095,005 e	3,018,778 e	18
November	15,069,700 e	3,048,508 e	18
December	14,753,839 e	3,083,141 e	18
2017 Average	**14,630,956 e**	**3,025,516 e**	**18**

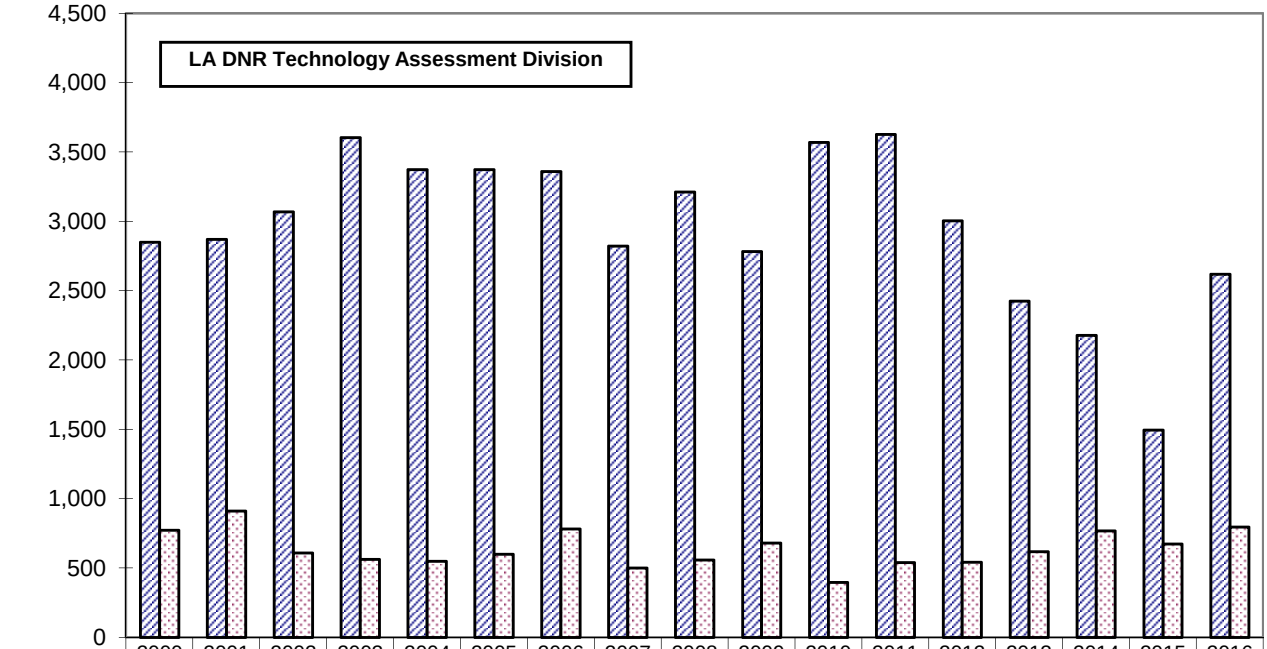
e Estimated r Revised p Preliminary See footnote in Appendix B

Exxon-Mobil Refinery - Baton Rouge

Figure 21

LOUISIANA LIGNITE PRODUCTION BY MINE SOURCE

(Thousand Tons Shipped)



	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Dolet Hills	2,850	2,872	3,069	3,604	3,373	3,374	3,361	2,823	3,213	2,783	3,571	3,627	3,005	2,425	2,178	1,495	2,620
Oxbow	773	912	609	564	548	599	783	500	559	681	397	541	541	619	769	674	797
Total	3,622	3,784	3,678	4,168	3,921	3,973	4,144	3,323	3,772	3,464	3,993	4,168	3,622	3,138	3,095	2,363	3,616

Table 40

LOUISIANA ELECTRIC UTILITIES NET ELECTRICITY GENERATION [14] BY FUEL TYPE

(Million KWH)

YEAR	COAL	OIL	GAS	NUCLEAR	TOTAL
1976	0	0	7,773	37,343	0
1977	0	0	13,255	35,196	0
1978	0	0	14,568	36,935	0
1979	0	0	8,259	38,396	0
1980	0	0	4,787	40,952	0
1981	1,529	0	2,634	39,947	0
1982	4,998	0	940	35,594	0
1983	8,377	0	356	28,311	0
1984	9,830	0	140	29,360	0
1985	13,968	0	100	27,736	2,457
1986	12,642	2,884	419	26,202	10,637
1987	12,176	2,926	60	23,823	12,324
1988	14,372	4,059	272	24,286	13,785
1989	14,227	3,854	298	21,900	12,391
1990	13,890	3,910	130	26,061	14,197
1991	14,786	4,126	45	24,245	13,956
1992	15,613	4,183	483	24,554	10,356
1993	15,794	3,572	1,838	23,751	14,398
1994	15,761	4,364	680	26,586	12,779
1995	14,632	4,321	49	30,867	15,686
1996	14,630	4,002	273	23,972	15,765
1997	16,453	4,499	645	26,580	13,511
1998	16,131	4,631	600	28,318	16,428
1999	16,386	4,780	397	30,162	13,112
2000	6,676 *	5,145	840	26,669	15,796
2001	6,136 *	4,731	1,775	20,284	17,366
2002	12,259 *	68	25,086	17,305	54,922
2003	11,020 *	1,008	15,094	16,126	43,485
2004	11,324 *	3,694	15,139	17,080	47,604
2005	11,416 *	3,378	13,688	15,676	44,158
2006	11,545 *	1,757	10,854	16,735	40,891
2007	10,736 *	1,977	13,872	17,078	43,523
2008	11,213 *	1,901	14,680	15,371	43,164
2009	11,025 *	1,460	14,325	16,782	43,592
2010	11,226 *	2,891	18,924	18,639	51,681
2011	11,860 *	4,378	22,071	16,615	54,924
2012	11,163 *	2,701	22,525	15,659	52,048
2013	9,843 *	4,476	24,227	16,954	56,226
2014	8,538 *	4,791	27,878	17,311	58,518
2015	9,125 *	4,021	37,283	15,301	65,730
2016	8,062 *	4,582	34,690	17,152	64,486

* Cajun Electric Power Cooperative's purchase by Louisiana Generating LLC changed their classification from electric utility to independent power producer.

e Estimated r Revised p Preliminary See footnote in Appendix B

Appendix A

Abbreviations

BCF	Billion Cubic Feet
BTU	British Thermal Unit
DNR	Louisiana Department of Natural Resources
DOE	United States Department of Energy
DOI	United States Department of the Interior
EIA	Energy Information Administration, DOE
FOB	Free on Board
GOM	Gulf of Mexico
KWH	Kilowatt-hours
MBBLS	Thousand Barrels
MCF	Thousand Cubic Feet
MMB	Million Barrels
MMS	Minerals Management Service, DOI
MST	Thousand Short Tons
NGC	Natural Gas Clearinghouse
OCS	Outer Continental Shelf
OPEC	Organization of Petroleum Exporting Countries
RAC	Refinery Acquisition Costs
SLS	South Louisiana Sweet Crude Oil
SPR	Strategic Petroleum Reserve
TBTU	Trillion BTU
TCF	Trillion Cubic Feet

State Abbreviations Used in the Louisiana Energy Facts Annual

AL	Alabama	MS	Mississippi
AK	Alaska	MT	Montana
AR	Arkansas	ND	North Dakota
CA	California	NM	New Mexico
CO	Colorado	OK	Oklahoma
IL	Illinois	PA	Pennsylvania
KS	Kansas	TX	Texas
LA	Louisiana	UT	Utah
MI	Michigan	WY	Wyoming

Appendix B

Data Sources*

1. EMPLOYMENT AND TOTAL WAGES PAID BY EMPLOYERS SUBJECT TO LOUISIANA EMPLOYMENT SECURITY LAW, Baton Rouge, LA: Louisiana Department of Labor, Office of Employment Security, Research and Statistics Unit.

2. MONTHLY ENERGY REVIEW and ANNUAL ENERGY REVIEW, Washington, D.C.: U.S. Department of Energy, Energy Information Administration.

3. NATURAL GAS MONTHLY and NATURAL GAS ANNUAL, Washington, D.C.: U.S. Department of Energy, Energy Information Administration.

4. BAKER HUGHES ROTARY RIGS COUNT, Houston, TX: Baker Hughes Inc.

5. October 2002 to Present, NATURAL GAS WEEK, Washington, D.C.: Energy Intelligence Group. Prior, SURVEY OF DOMESTIC SPOT MARKET PRICES, Houston, TX: Dynegy Inc. (formerly Natural Gas Clearinghouse).

6. PETROLEUM MARKETING MONTHLY and PETROLEUM MARKETING ANNUAL, Washington, D.C.: U.S. Department of Energy, Energy Information Administration.

7. PETROLEUM SUPPLY MONTHLY and PETROLEUM SUPPLY ANNUAL, Washington, D.C.: U.S. Department of Energy, Energy Information Administration.

8. SEVERANCE TAX, Baton Rouge, LA: Louisiana Department of Revenue, Severance Tax Section. The severance tax reported production volumes are different from actual production due to reporting time lag and well tax exemptions.

9. U.S. CRUDE OIL, NATURAL GAS and NATURAL GAS LIQUIDS RESERVES, Washington, D.C.: U.S. Department of Energy, Energy Information Administration.

10. THE WALL STREET JOURNAL, Gulf Coast Edition, Beaumont, TX: Dow Jones and Company.

11. STATE ENERGY DATA REPORT, Washington, D.C.: U.S. Department of Energy, Energy Information Administration.

12. FEDERAL OFFSHORE STATISTICS, Washington, D.C.: U.S. Department of the Interior, Bureau of Ocean Energy Management.

13. NATURAL RESOURCES REVENUE, Denver, CO: U.S. Department of the Interior, Office of Natural Resources Revenue.

14. ELECTRIC POWER MONTHLY, Washington, D.C.: U.S. Department of Energy, Energy Information Administration.

- Unless otherwise specified, data is from the Louisiana Department of Natural Resources.

An Explanation of Changes in Oil and Gas Statistics

Note # 1

Current production data and all future reports will reflect changes due to modifications in the reporting system by the Department of Natural Resources Office of Conservation, Production Audit Section. Only the oil and gas production data in state jurisdiction is affected.

The new data for oil will not include crude oil, condensate or raw make recovered from natural gas processing plants. In the past, these products were added to the state production as crude oil or condensate.

A separate report on gas plants liquids production is not available at the present.

In addition, the gas data system has been adjusted to reflect reporting production on the date produced. Previously, it had been reported on the date first purchased.

The new reporting system should produce more accurate and timely data.

The Technology Assessment Division is not the source of these data sets, but merely reports data provided to us by the Office of Conservation. However, we understand that users of our time series data need consistency over time. For that reason, our time series has been adjusted backwards to 1980 using these new definitions.

Note # 2

Producing oil and gas well data since 2000 reflect changes due to modifications in the reporting system by the Department of Natural Resources Office of Conservation.

The new data for oil and natural gas producing wells count them as productive if they had any production in the month, previous system counted only the producing wells at the end of the month. The new reporting system should produce more accurate and timely data.

The Technology Assessment Division is not the source of these data sets, but merely reports data provided to us by the Office of Conservation. However, we understand that users of our time series data need consistency over time, but due to lack of accurate information the time series has been adjusted backwards to 2000 using the new system.

Other factors that affected the big increase on wells numbers are the big jump on energy prices around 2000, and the inactive wells

Outer Continental Shelf Lands Act (OCSLA)

The OCSLA of 1953 (67 Stat. 462), as amended (43 U.S.C. 1331 et seq. (1988)) established Federal jurisdiction over submerged lands on the Outer Continental Shelf (OCS) seaward of State boundaries. Under the OCSLA, the Secretary of the Interior is responsible for the administration of mineral exploration and development of the OCS. The Act empowers the Secretary to grant leases to the highest qualified responsible bidder(s) on the basis of sealed competitive bids and to formulate such regulations as necessary to carry out the provisions of the Act. The Act, as amended, provides guidelines for implementing an OCS oil and gas exploration and development program. The basic goals of the Act include the following:

1. To establish policies and procedures for managing the oil and natural gas resources of the OCS that are intended to result in expedited exploration and development of the OCS in order to achieve national economic and energy policy goals, assure national security, reduce dependence on foreign sources, and maintain a favorable balance of payments in world trade.
2. To preserve, protect, and develop oil and natural gas resources of the OCS in a manner that is consistent with the need
    (a) to make such resources available to meet the nation's energy needs as rapidly as possible;
    (b) to balance orderly resource development with protection of the human, marine, and coastal environments;
    (c) to ensure the public a fair and equitable return on the resources of the OCS;
    (d) to preserve and maintain free enterprise competition.
3. To encourage development of new and improved technology for energy resource production, this will eliminate or minimize risk of damage to the human, marine, and coastal environments.

Royalty revenues from Federal offshore leases on the OCS are distributed to the Land and Water Conservation Fund, the Historic Preservation Fund, and the General Fund of the U.S. Treasury. Transfers are made in each fiscal year from OCS royalties, rentals and bonuses in order to maintain the Land and Water Conservation Fund's annual authorization of $900 million. Annually, $150 million is put into the Historic Preservation Fund. The balance of offshore revenue receipts is directed to the General Fund of the U.S. Treasury.

Section 8(g) of the OCSLA Amendments of 1978 provided that the states were to receive a "fair and equitable" division of revenues generated from the leasing of lands within 3 miles of the seaward boundary of a coastal state that contains one or more oil and gas pools or fields underlying both the OCS and lands subject to the jurisdiction of the state. The states and the federal government, however, were unable to reach agreement concerning the meaning of the term "fair and equitable." Revenues

generated in the 3-mile boundary zone were subsequently placed into an escrow fund in August 1979.

Congress resolved the dispute over the meaning of "fair and equitable" in the Outer Continental Shelf Lands Act Amendments of 1985, Public Law 99-272. The amendments required that the affected coastal state will receive 27 percent of the revenues generated from the leasing and development of oil and natural gas resources located in the Federal 8(g) zone. The law provided for the following distribution of revenues to Louisiana under section 8(g):

Before 1986: Louisiana did not receive any shared revenue from OCS production prior to 1986.

1986: Louisiana received a payment of $68.7 million from royalties, rentals and bonuses collected in 1986 and prior years.

1998-2000: In 1987 Louisiana received an initial settlement payment of $572 million from the escrow funds. A series of annual settlement payments have been disbursed to the states over a 15-year period along with an annual disbursement of 27 percent of royalty, rental, and bonus revenues received within each affected state's 8(g) zone. The annual settlement payments are: From 1987 through 1991, Louisiana received an annual settlement payment of $2.52 million per year. From 1992 through 1996, the state received an annual settlement payment of $5.88 million per year. Beginning in 1997 until the last payment in 2001, Louisiana will receive an annual settlement payment of approximately $8.40 million per year.

2002 and After: No further settlement payments; states receive only a recurring annual disbursement of 27 percent of royalty, rental, and bonus revenues received within each affected state's 8(g) zone. Louisiana will receive an annual disbursement of 27 percent of royalty, rental, and bonus revenues received within Louisiana's affected 8(g) zone.

Gulf of Mexico Energy Security Act (GOMESA)

On December 20, 2006, the President signed into law the GOMESA of 2006 (Pub. Law 109-432). The Act significantly enhances OCS oil and gas leasing activities and revenue sharing in the Gulf of Mexico (GOM). The Act:

A. Stipulated that 8.3 million acres be offered for oil and gas leases. This acreage is included in both the Central Gulf Planning Area and the Eastern Gulf Planning Area. The 8.3 million acres consist of approximately 2 million acres in the Central Gulf, it was the first that was offered for lease after enactment of the law and was included in Lease Sale 205 in October 2007; additional .5 million acres in the Eastern Gulf received additional environmental review and was offered in

Lease Sale 224 in March 2008; and the remaining 5.8 million acres in the Central Gulf was offered for leasing at Lease Sale 208 in March 2009.

B. Updated moratoria (bans) areas in the Gulf. Those tracts in the Eastern Gulf of Mexico that are within 125 miles of Florida, all tracts east of the Military Mission Line, and tracts in the Central Gulf of Mexico within 100 miles of Florida that are included in the moratorium area which extends until 2022.

C. Created revenue sharing provisions for four Gulf oil and gas producing States – Alabama, Louisiana, Mississippi and Texas, and their coastal political subdivisions. There are two phases in the GOMESA revenue sharing.

    a. Phase 1: Beginning in Fiscal Year 2007, 37.5 percent of all qualified OCS revenues, including bonus bids, rentals and production royalty, will be shared among the four States and their coastal political subdivisions from those new leases issued in the 181 Area in the Eastern planning area (also known as the 224 Sale Area) and the 181 South Area. Additionally, 12.5 percent of revenues are allocated to the Land and Water Conservation Fund (LWCF). The final regulations for Phase I revenue sharing were issued on December 23, 2008 and specify that the Bureau intends to disburse funds on or before March 31st of the fiscal year following the fiscal year to which the qualified OCS revenues were attributed..

    b. Phase 2: The second phase of GOMESA revenue sharing begins in Fiscal Year 2017. It expands the definition of qualified OCS revenues to include receipts from GOM leases issued either after December 20, 2006, in the 181 Call Area, or, in 2002–2007 GOM Planning Areas subject to withdrawal or moratoria restrictions. A revenue sharing cap of $500 million per year for the four Gulf producing States, their CPS's and the LWCF applies from fiscal years 2016 through 2055. The $500 million cap does not apply to qualified revenues generated in those areas associated with Phase I of the GOMESA program. The Bureau will address the second phase of GOMESA revenue sharing in a subsequent rulemaking.

D. Allowed for the exchange of existing leases in the moratorium areas for bonus or royalty credit to be used in the Gulf of Mexico. A credit will be provided to lessees who relinquish certain eligible leases in the Gulf of Mexico. Leases are considered eligible if they lie within 125 miles of the Florida Coast in the Eastern Planning Area or within 100 miles of the Florida Coast in the Central Planning Area. The lessees will be allowed to use the credits in lieu of monetary payment for either a lease bonus bid or royalty due on oil and gas production from most other leases in the Gulf of Mexico or transfer the credits to other Gulf of Mexico lessees for their use.

Appendix C

Glossary

Bonus. A cash payment by the lessee for the execution of a lease. A lease is a contract that gives a lessee the right: (a) To search for minerals, (b) to develop the surface for extraction, and (c) to produce minerals within the area covered by the contract.

Casinghead Gas. All natural gas released from oil during the production of oil from underground reservoirs.

City-Gate. A point or measuring station at which a gas distribution company receives gas from a pipeline company or transmission system.

Commercial Consumption. Gas used by non-manufacturing organizations such as hotels, restaurants, retail stores, laundries, and other service enterprises. This also includes gas used by local, state, and federal agencies engaged in non-manufacturing activities.

Condensate. (See Lease Condensate)

Crude Oil. A mixture of hydrocarbons that existed in the liquid phase in natural underground reservoirs and remains liquid at atmospheric pressure after passing through surface separating facilities.

CRUDE OIL PRICES

Domestic Wellhead. The average price at which all domestic crude oil is first purchased.

Imports FOB. The price actually charged at the producing country's port of loading. It is the responsibility of the buyer to arrange for transportation and insurance.

Imports Landed. The dollar per barrel price of crude oil at the port of discharge. It includes crude oil landed in the U.S. and U.S. company-owned refineries in the Caribbean, but excludes crude oil from countries that export only small amounts to the United States. The landed price does not include charges incurred at the port of discharge.

Imports OPEC FOB. The average price actually charged by OPEC at their country's port of loading. This price does not include transportation or insurance.

OCS Gulf. The average price at which all offshore, Outer Continental Shelf, Central Gulf region crude oil is first purchased as reported by the U.S. Department of Energy, Energy Information Administration.

Refinery Acquisition Costs (RAC). The average price paid by refiners in the U.S. for crude oil booked into their refineries in accordance with accounting procedures generally accepted and consistently and historically applied by the refiners.

a) **Domestic**. The average price of crude oil produced in the United States or from the Outer Continental Shelf of the U.S.

b**) Imports**. The average price of any crude oil not reported as domestic.

Refinery Posted. The average price from a survey of selected refiners' postings for Light Louisiana Sweet (LLS) crude, which is effective at the middle and at the end of the month.

Severance Tax. The average wellhead price calculated from oil severance taxes paid to the Louisiana Department of Revenue and Taxation.

Spot Market. The spot market crude oil price is the average of daily Light Louisiana Sweet (LLS) crude price futures traded in the month and usually includes transportation from the producing field to the St. James, Louisiana terminal.

State. The average price at which all Louisiana crude oil, excluding Louisiana OCS, is first purchased as reported in a survey by the U.S. Department of Energy, Energy Information Administration.

State Royalty. The average wellhead price from its royalty share of oil produced in state lands or water bottoms. The price is calculated by the ratio of received oil royalty gross revenue divided by royalty volume share reported to the Louisiana Department of Natural Resources.

Developmental Well. Wells drilled within the proved area of an oil or gas reservoir to the depth of a stratigraphic horizon known to be productive.

Dry Gas. (See Natural Gas, "Dry")

Dry Hole. An exploratory or developmental well found to be incapable of producing either oil or gas in sufficient quantities to justify completion as an oil or gas well.

Electric Utility Consumption. Gas used as fuel in electric utility plants.

Exploratory Well. A well drilled to find and produce oil or gas in an unproved area, to find a new reservoir in an old field, or to extend the limits of a known oil or gas reservoir.

Exports. Crude oil or natural gas delivered out of the Continental United States and Alaska to foreign countries.

Extraction Loss. The reduction in volume of natural gas resulting from the removal of natural gas liquid constituents at natural gas processing plants.

Federal Offshore or Federal OCS. (See Louisiana OCS)

Federal Onshore. They are lands in the United States for which ownership is claimed by the U.S. federal government, pursuant to Article Four, section 3, clause 2 of the United States Constitution**.**

FOB Price (Free on board). The price actually charged at the producing country's port of loading. The reported price includes deductions for any rebates and discounts or additions of premiums where applicable and should be the actual price paid with no adjustment for credit terms.

Gate. (See City-Gate)

Gross Revenue. Amount of money received from a purchaser, including charges for field gathering, transportation from wellhead to purchaser receiving terminal, and state production severance tax.

Gross Withdrawals. (See Natural Gas, Gross Withdrawals)

Imports. Crude oil or natural gas received in the Continental United States, Alaska, and Hawaii from foreign countries.

Industrial Consumption. Natural gas used by manufacturing and mining establishments for heat, power, and chemical feedstock.

Lease Condensate. A mixture consisting primarily of pentane and heavier hydrocarbons that is recovered as a liquid from natural gas in lease or field separation facilities, exclusive of products recovered at natural gas processing plants or facilities.

Lease Separator. A facility installed at the surface for the purpose of: (a) Separating gases from produced crude oil and water at the temperature and pressure conditions of the separator, and/or (b) separating gases from that portion of the produced natural gas stream which liquefies at the temperature and pressure conditions of the separator.

Louisiana OCS. Submerged lands under federal regulatory jurisdiction that comprise the Continental Margin or Outer Continental Shelf adjacent to Louisiana and seaward of the Louisiana Offshore region.

Louisiana Offshore. A 3-mile strip of submerged lands under state regulatory jurisdiction located between the State coast line and the OCS region.

Louisiana Onshore. Region defined by the State boundary and the coast line.

Major Pipeline Company. A company whose combined sales for resale, and gas transported interstate or stored for a fee, exceeded 50 million thousand cubic feet in the previous year.

Marketed Production. (See Natural Gas, Marketed Production)

Natural Gas. A mixture of hydrocarbon compounds and small quantities of various non-hydrocarbons existing in the gaseous phase or in solution with crude oil in natural underground reservoirs at reservoir conditions. The principal hydrocarbons usually contained in the mixture are methane, ethane, propane, butanes and pentanes. Typical non-hydrocarbon gases that may be present in reservoir natural gas are carbon dioxide, helium, hydrogen sulfide and nitrogen. Under reservoir conditions, natural gas and the liquefiable portions occur either in a single gaseous phase in the reservoir or in solution with crude oil, and are not distinguishable at the time as separated substances.

Natural Gas, "Dry". The actual or calculated volume of natural gas which remains after: (a) The liquefiable hydrocarbon portion has been removed from the gas stream, and (b) any volumes of non-hydrocarbon gases have been removed where they occur in sufficient quantity to render the gas unmarketable.

Natural Gas, Gross Withdrawals. It is the full well-stream volume, including all natural gas plant liquids and all non-hydrocarbon gases, but excluding lease condensate.

Natural Gas Liquids. Lease condensate plus natural gas plant liquids.

Natural Gas, Marketed Production. Gross withdrawals less gas used for pressurizing, quantities vented and flared, and non-hydrocarbon gases removed in treating or processing operations. It includes all quantities of gas used in field and processing operations.

Natural Gas, OCS Gas. OCS gas volume is as reported. Most are "dry" gas, though some are "wet" gas.

Natural Gas Plant Liquids. Those hydrocarbons remaining in a natural gas stream after field separation and later separated and recovered at a natural gas processing plant or cycling plant through the processes of absorption, adsorption, condensation, fractionation or other methods. Generally such liquids consist of propane and heavier hydrocarbons and are commonly referred to as condensate, natural gasoline, or liquefied petroleum gases. Where hydrocarbon components lighter than propane (e.g., ethane) are recovered as liquids, these components are included with natural gas liquids.

NATURAL GAS PRICES

Henry Hub Settled NYMEX. The last trading day price for the month before delivery posted in the New York Mercantile Exchange for natural gas at Henry Hub.

Spot Market. The average price of natural gas paid at the regional spot market receipt points or zones as reported by the Energy Intelligence Group's NATURAL GAS WEEK. The data are a volume weighted average and reflect market activity information gathered during the entire month before the publication date, regardless of delivery date. The data are not an arbitrary weighting by production zone, but a true deal-by-deal volume weighting of prices gathered. Data prior to October 2002 were from Dynegy's survey of the domestic natural gas spot market receipt points or zones located in Louisiana. The new and old points or zones are as follows:

NATURAL GAS PIPELINES AND SALES POINTS FOR PRICES

Dynegy	Natural Gas Week
ANR	ANR
Eunice, LA	Patterson, LA
COLUMBIA GULF	COLUMBIA GULF TRANSMISSION CO.
Average Louisiana onshore laterals	Average of Erath, Rayne, and Texaco Henry Plant in Louisiana
LOUISIANA INTRASTATES	LOUISIANA INTRASTATES
Average of Faustina, Bridgeline, LIG, and Monterrey pipelines	Average of LIG, Bridgeline, LRC, and Acadian pipelines
SOUTHERN NATURAL	SONAT
South Louisiana	Saint Mary Parish, LA
TENNESSEE GAS	TENNESSEE GAS
Vinton, LA	Average Zone 1 of 500 & 800
TEXAS GAS TRANSMISSION	TEXAS GAS TRANSMISSION
Zone 1 (North Louisiana)	Zone 1 (North Louisiana)
GULF SOUTH PIPELINE	TRUNKLINE GAS CO.
	HENRY HUB

OCS. The average wellhead price calculated from sales and volumes from Louisiana OCS natural gas as reported by the U.S. Department of Interior, Office of Natural Resources Revenue.

State Royalty. The average wellhead price calculated from revenue received and volumes reported to the Louisiana Department of Natural Resources.

State Wells. The average price of gas sold at Louisiana wellhead. This price includes: (a) Value of natural gas plant liquids subsequently removed from the gas, (b) gathering and compression charges, and (c) state production, severance, and/or similar charges.

MAJOR PIPELINES PURCHASES.

a) **Domestic Producers**. The average price of natural gas produced in the United States or from the Outer Continental Shelf of the U.S.

b**) Foreign Imports**. The average price of any natural gas not reported as domestic.

Wellhead. The wellhead sales price including: (a) Value of natural gas plant liquids subsequently removed from the gas, (b) gathering and compression charges, and (c) state production, severance, and/or similar charges.

Natural Gas Plant Liquids (NGPL). NGPL are those hydrocarbons in natural gas that are separated as liquids at natural gas processing, fractionating, and cycling plants. Products obtained include ethane, liquefied petroleum gases (propane, normal butane, and isobutene), and natural gasoline. Component products may be fractionated or mixed. Lease condensate and plant condensate are excluded. Cycling plants are classified as gas processing plants or facilities designed to recover natural gas liquids from a stream of natural gas that may or may not have passed through lease separators and/or field separation facilities. These facilities control the quality of the natural gas to be marketed. Note: Some EIA publications categorize NGPL production as field production, in accordance with definitions used prior to January 2014.

Natural Gas, Wet After Lease Separation. The volume of natural gas, if any, remaining after: (a) Removal of lease condensate in lease and/or field separation facilities, and (b) exclusion of non-hydrocarbon gases where they occur in sufficient quantities to render the gas unmarketable. Also excludes gas returned to formation in pressure maintenance and secondary recovery projects and gas returned to earth from cycling and/or gasoline plants. Natural gas liquids may be recovered from volumes of natural gas, wet after lease separation, at natural gas processing plants.

Organization of Petroleum Exporting Countries (OPEC). Countries that have organized for the purpose of negotiating with oil companies on matters of oil production, prices, and future concession rights. Current members are Algeria, Gabon, Indonesia, Iran, Iraq, Kuwait, Libya, Nigeria, Qatar, Saudi Arabia, the United Arab Emirates, and Venezuela.

Outer Continental Shelf (OCS). All submerged lands that comprise the Continental Margin adjacent to the U.S. and seaward of the state offshore lands. Production in the OCS is under federal regulatory jurisdiction and ownership.

Processing Plant. A facility designed to recover natural gas liquids from a stream of natural gas which may or may not have passed through lease separators and/or field separation facilities. Another function of natural gas processing plants is to control the quality of the processed natural gas stream.

Proved Reserves of Crude Oil. As of December 31 of the report year, the estimated quantities of all liquids defined as crude oil which geological and engineering data demonstrate with reasonable certainty to be recoverable in future years from known reservoirs under existing economic and operating conditions. Volumes of crude oil in underground storage are not considered proved reserves.

Proved Reserves of Lease Condensate. The volumes of lease condensate as of December 31 of the report year expected to be recovered in future years in conjunction with the production of proved reserves of natural gas as of December 31 of the report year.

Proved Reserves of Natural Gas. The estimated quantities of natural gas as of December 31 of the report year which analysis of geologic and engineering data demonstrates with reasonable certainty to be recoverable in future years from known reservoirs under existing economic and operating conditions. Volumes of natural gas in underground storage are not considered proved reserves.

Proved Reserves of Natural Gas Liquids. The volumes of natural gas liquids (including lease condensate) as of December 31 of the report year, which analysis of geologic and engineering data demonstrates with reasonable certainty to be separable in the future from proved natural gas reserves under existing economic and operating conditions.

Rental. Money paid by the lessee to maintain the lease after the first year if it is not producing. A lease is considered expired when rental is not paid on time on an unproductive lease.

Reservoir. A porous and permeable underground formation containing an individual and separate natural accumulation of producible hydrocarbons (oil and/or gas) which is confined by impermeable rock or water barriers and is characterized by a single natural pressure system. Reservoirs are considered proved if economic producibility is supported by actual production or conclusive formation tests (drill stem or wire line), or if economic producibility is supported by core analysis and/or electric or other log interpretations. The area of a gas or oil reservoir considered proved includes: (a) That portion delineated by drilling and defined by gas-oil and/or gas-water contacts, if any; and (b) the immediately adjoining portions not yet drilled, but which can be reasonably judged as economically productive on the basis of available geological and engineering data.

Residential Consumption. Gas used in private dwellings, including apartments, for heating, cooking, water heating, and other household uses.

Royalty Interest. Those interests which entitle their owner(s) to a share of the mineral production from a property or to a share of the proceeds from there. These interests do

not contain the rights and obligations of operating the property and normally do not bear any of the costs of exploration, development, or operation of the property.
Royalty Override (Or Overriding Royalty). An overriding royalty interest is a percentage of oil and gas revenue from a producing well free of all drilling and producing costs. It is carved out of the lessee's or working interest owner and paid by the lessee or working interest owner. It is limited in duration to the terms of an existing lease, not subject to any of the expenses of development, operation or maintenance, and not connected to an ownership of minerals under the ground, and it is royalty in addition to the usual landowner's royalty reserved to the lessor.

Severance Tax. It is levied on production of natural resources taken from land or water bottoms within the territorial boundaries of the state. The state collects no severance from production in federal waters in the Gulf which start three miles from the Louisiana coastline. Natural resources are all forms of timber, including pulp woods, and turpentine and other forest products; minerals such as oil, gas, natural gasoline, distillate, condensate, casinghead gasoline, sulphur, salt, coal, lignite, and ores; also marble, stone, gravel, sand, shells, and other natural deposits; and the salt content in brine**.**

State Offshore. (See Louisiana Offshore**)**

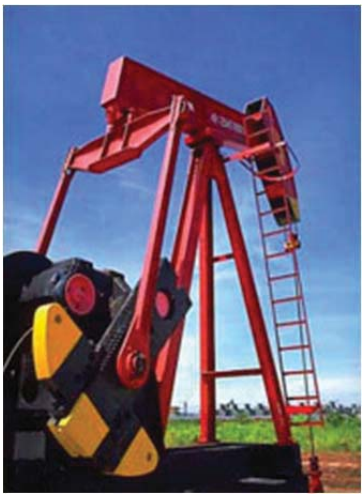
Wet After Lease Separation. (See Natural Gas, Wet After Lease Separation)

Wildcat Well. (See Developmental Well)

Appendix D

Louisiana Energy Topics

Page



ENERGY EFFICIENCY AND RENEWABLE ENERGY IN RESIDENTIAL BUILDING ENERGY CODES

by
Patty Nussbaum

The role of renewable energy as a way to meet the provisions of residential building energy codes is under discussion as part of the 2018 International Energy Conservation Code (IECC) development process. Energy efficient buildings reduce the electricity required from the grid. Renewable energy resources reduce the emissions associated with generating electricity. The U. S. Department of Energy (DOE) supports both energy efficiency and renewable energy, and following is a summary of the DOE position. The complete DOE position paper can be accessed by following the link in the footnote. [1]

Building Codes

Building energy codes have been in place since the 1970's. Code requirements were met by reducing energy use. The 2015 edition of the IECC added a new compliance path, the Energy Rating Index (ERI). The ERI compliance path was modeled after RESNET's Home Energy Rating System (HERS), which gives credit for renewables. The HERS gives credit for renewables so a house with photovoltaics (PV) would not need as much energy efficiency to reach the same score as a house without PV.

DOE Authority on Energy Efficiency and Building Energy Codes[2]

DOE participates in the code amendment process.

DOE reviews updated editions of the model codes and issues a determination as to whether the new edition will improve energy efficiency in residential and/or commercial buildings.

DOE Position

Any potential tradeoffs between efficiency and renewables should only be allowed at or below the ERI values in Table R406.4 of the 2015 IECC[3].

Renewables have a place in future energy codes, but any compliance credit for onsite renewables should consider energy delivered to the home on which they are installed and not gross energy production or system size.

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[1] DOE Position on Energy Efficiency and Renewable Energy in Residential Building Energy Codes during the 2018 IECC Code Development Cycle **https://www.energycodes.gov/sites/default/files/DOE%20Position%20Brief%20for%20the%202018%20IECC_10062016.pdf** (accessed 12/01/2016).

[2] Title III of the Energy Conservation and Production Act, as amended (42 U.S.C. 6831 *et seq*.).

[3] 2015 International Energy Conservation Code http://codes.iccsafe.org/app/book/content/2015-I-Codes/2015%20IECC%20HTML/Chapter%204%20[RE].html.

Next Steps

DOE will engage with key stakeholders.

DOE will participate in the code hearings to support this position.

DOE will participate in any ANSI/RESNET/ICC 301 Standard process that would establish provisions for counting renewable energy in the HERS score.

DOE will identify a tool that provides location-specific estimates of the amount of annual energy delivered per kW of installed PV panels.

Several proposals were submitted during the 2018 IECC development process attempting to define renewables or limit their use in the ERI compliance path. DOE supports cost effective energy efficiency continuing to increase in new code versions, but does not support unlimited tradeoffs for renewables in the code. However, DOE does support increasing the use of renewable energy outside the building codes.

2017 STATE OIL AND GAS: PRODUCTION AND PRICE PROJECTIONS

by
Manuel Lam

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 ninth largest producer of crude oil and the fourth largest producer of natural gas in the U.S., excluding the federal Outer Continental Shelf (OCS) production. Louisiana is second in per capita energy consumption and it is second in industrial energy consumption. The petrochemical and petroleum refining industries located in the state are the main reason for Louisiana's high-energy use. They are extremely energy intensive and rely on Louisiana's abundance of natural resources and historically low energy prices. Despite the location of these industries, the bulk of the final consumption of their products is in other states as well as overseas.

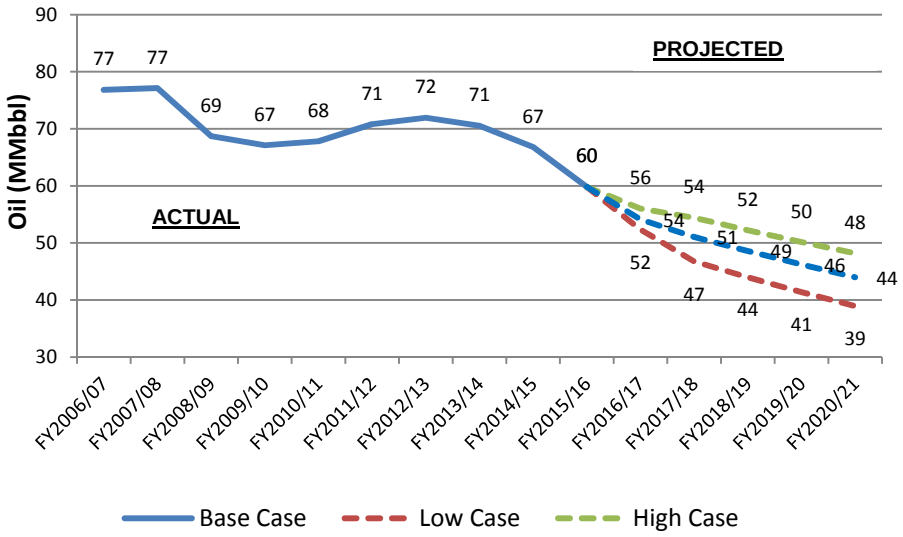
Following are other interesting benchmarks in the Louisiana oil and gas production history. In 1910, the first freestanding, above-water platform was used in Caddo Lake, near Shreveport. In 1938, the first well over water was completed in the Gulf of Mexico near Creole, offshore Cameron Parish. In 1947, 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, the Haynesville Shale started producing natural gas, making gas a predominate factor in new production. In 2010, Louisiana oil production slowly reversed its declining trend due to production from oil shale formations and enhanced recovery in mature fields. Since 2014, Louisiana oil and gas productions are declining due to low oil and gas prices, cheaper production costs in other U.S. oil and gas shale fields, gas plays containing higher gas liquids, and being closer to the consumer market.

Production Projections

Crude Oil

The Louisiana state oil production, excluding federal OCS, showed an average decline of 2.3% per year over the past five years, but actual year-to-year change varies widely. The recovery from the hurricanes Katrina and Rita disaster, and rising oil prices caused increases in FY2007/08 production volumes. Hurricanes Gustav and Ike caused a 10.91% decline in FY2008/09. A plunge in oil prices in FY2009/10 kept the production declining. The delayed recovery from weather disasters and new production from enhanced oil recovery in old oil fields increased FY2010/11 production. Production from enhanced oil recovery fields, initial production from oil shale formations, and high oil prices increased production in FY2011/12. In FY2013/14, the consistent oil prices and production difficulties in the oil shale formations reversed the increase in oil production trends. In FY2014/15, the decline continued, due to lower oil prices, lower demand, and high oil inventory in stock. In FY2015/16, the decline continued due to low oil prices and shifting oil exploration from Louisiana to oil shale plays in Texas or North Dakota. Their oil wells produce a better rate returns to investment. The Department of Natural Resources (DNR) Technology Assessment Division short-term model projects oil production decline over the next five years. Assuming crude oil prices would stay below $55 per barrel and no major weather disruptions occur. Figure 1 shows the projections for the next five years. If prices go over $60 per barrel for an extended period, the projections will be closer to the high case trend.

Figure 1: Louisiana Historical and Projected Crude Oil Productions



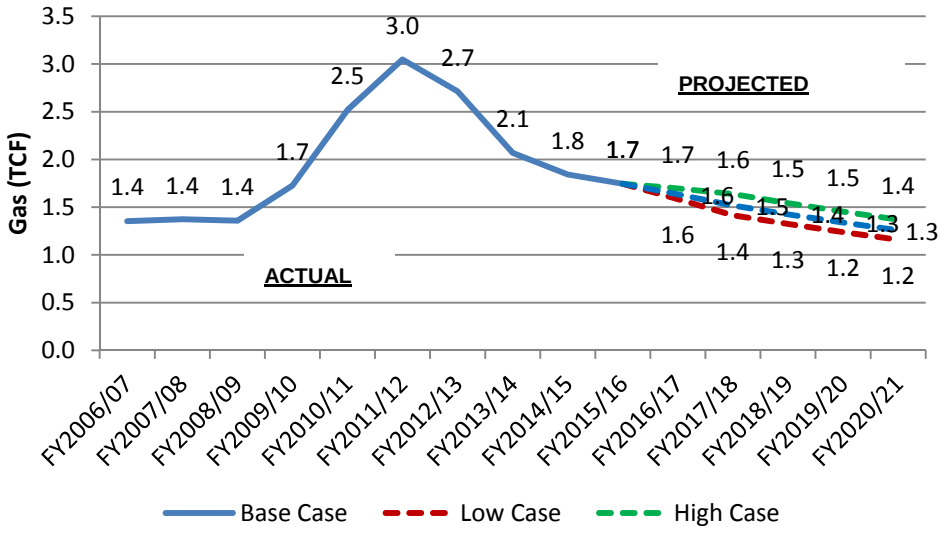
Natural Gas

Similar to oil, gas production varies from year-to-year, reflecting the severity of weather patterns and prices. In FY2006/07, the Haynesville Shale dry gas field appeared 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 more than doubled to around 3.0 TCF. In FY2012/13, gas production dropped to 2.7 TCF, caused by a drop in drilling activities. In FY2013/14, production dropped to 2.1 TCF due to low prices and competition from other gas shale plays. In FY2014/15, gas production declined to 1.8 TCF and in FY2015/16, gas production declined to 1.7 TCF due to continuous low gas prices and low consumption. Figure 2 shows the DNR Technology Assessment Division short-term model projections for the next five years. The projections assume that the weather will be mild without major disruptions and the average gas prices are above $2.00 per MCF.

In 2012, the gas price fell below $3 per MCF causing a slowdown in drilling activities in the Haynesville Shale areas. There were 93 active rigs in Haynesville areas in January 2012, dropping to 16 active rigs by January 2013, an 82.8% decline. The drop in drilling activities, cutback in production due to low prices, competition from wet shale plays, and overstock of gas in storage curtailed the gas production in Louisiana. In January 2014, drilling active gas rigs recovered to 37 rigs, caused by rising gas prices, an expected demand increase, and exports. In January 2015, drilling gas rigs dropped to 25 rigs due to declining prices and improvements in drilling techniques. In January 2016, drilling rigs increased to 35 despite low gas prices, the increase can be attributed to the expectation of starting LNG export from Louisiana's LNG exporting terminals. In January 2017, drilling gas rigs dropped to 30 rigs, even with rising oil and gas price, due to competition from other states shale plays that have lower gas wells drilling cost than in Haynesville shale plays or has oil shale wells producing high volume of gas. 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 saltwater 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, 4-D, or carbon dioxide injection,
- state and local tax incentives,
- weather patterns, and
- imports/exports.

Figure 2: Louisiana Historical and Projected Natural Gas Productions



Price Projections

Oil Prices

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 curtailment by producing 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.

The most recent oil price slide started in the second half of 2014 as oil inventory built up. The buildup was caused by high production from oil shale plays; an increase from old fields using enhanced techniques; increased production in other producing countries; the slow recovery pace of the U.S. economy; and the recession of the Chinese economy. It appears that oil prices have bottomed out. The lowest point occurred on January 20, 2016 at $27.49 per barrel, and prices are recovering. The WTI oil price on March 3, 2017 was $52.68 per barrel. The following events should help increase the price of oil. Saudi Arabia production goals seem to change course. The Saudi's are now calling for production cuts, have an agreement with OPEC producers to reduce total oil production by 1.2 million barrels per day from January 1, 2017. Russia (one of the top three oil producers in the world) seems to sympathize with the production freeze at the January level. U.S. production has been slowly declining, especially in the shale plays as drilling slowed down; this might change as oil go over $50 per barrel for extended period. Moreover, other conditions could affect the market and push the price down. Venezuela, after years of political unrest, and Iraq, after years of internal wars, have the opportunity to produce the most they have in years, which will allow the oil sector to benefit the overall economies of both countries. Uncertainty in the Asian oil demand could prolong the high oil inventory, because of economic slowdown or energy policy change to renewable energy (solar panel). The oil price recovery will be slow as long as world oil inventory is high and demand does not increase.

Table 1: Louisiana Crude Oil Historical and Projected Prices

	Base Case		Low Case	High Case
FY2010/11	$85.73	25.39%	N/A	N/A
FY2011/12	$109.30	27.50%	N/A	N/A
FY2012/13	$105.05	-3.89%	N/A	N/A
FY2013/14	$103.40	-1.57%	N/A	N/A
FY2014/15	$76.22	-26.28%	N/A	N/A
FY2015/16	$44.35	-41.82%	N/A	N/A
FY2016/17	$47.64	7.42%	$38.40	$61.48
FY2017/18	$51.94	9.03%	$40.93	$63.96
FY2018/19	$52.46	0.99%	$42.72	$65.74
FY2019/20	$52.91	0.86%	$44.15	$67.17
FY2020/21	$53.38	0.89%	$45.26	$68.28

Louisiana crude oil average price was $106.36 per barrel in the spot market in February 2014, the price dropped to $55.28 per barrel in February 2015, it dropped to $32.48 in February 2016, and it recovered to $55.07 per barrel in February 2017. Table 1 shows the historical Louisiana Crude Oil prices and the projection for the next five years.

GAS PRICES

Louisiana natural gas average spot price was $5.96 per MCF in February 2014, the price dropped to $2.85 per MCF in February 2015, it dropped to $2.18 per MCF in February 2016, and it recovered to $2.96 per MCF in February 2017. Table 2 shows the historical Louisiana Natural Gas prices and the projection over the next five years.

The physical relationship between the crude oil price and the 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). This is because 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 17:1. Oil prices are higher because Asian countries are consuming more oil than gas and the political unrest in Venezuela, African and Islamic countries are disrupting oil supplies more heavily than gas supplies. 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 long, cold, winter weather will usually erase much of the psychological element of low gas prices and price increases.

The lack of mobility of natural gas between producing areas and consuming areas, caused by insufficient infrastructure as shown by the Federal Energy Regulatory Commission's December 2016 world LNG estimated landed prices. Gas prices are $8.77 per MMBTU in Japan and Korea, $8.62 per MMBTU in China, $8.64 per MMBTU in India, $5.58 per MMBTU in Belgium, $6.76 per MMBTU in Spain, $7.99 per MMBTU in Brazil, and in the U.S., it is $3.34 per MMBTU in Lake Charles and $6.66 per MMBTU in Cove Point. The low price in the U.S. is caused by the oversupply of gas for low demand due to warm weather and high production from shale plays. The price difference between Lake Charles and Cove Point is attributed to the level of access to pipeline networks.

Table 2: Louisiana Natural Gas Historical and Projected Prices

	Base Case		Low Case	High Case
FY2010/11	$4.31	-0.81%	N/A	N/A
FY2011/12	$3.28	-23.96%	N/A	N/A
FY2012/13	$3.48	6.07%	N/A	N/A
FY2013/14	$4.24	21.76%	N/A	N/A
FY2014/15	$3.33	-21.49%	N/A	N/A
FY2015/16	$2.15	-35.45%	N/A	N/A
FY2016/17	$2.81	31.02%	$2.12	$4.16
FY2017/18	$2.93	4.13%	$2.44	$4.35
FY2018/19	$2.79	-4.60%	$2.36	$4.27
FY2019/20	$2.76	-1.08%	$2.35	$4.28
FY2020/21	$2.81	1.52%	$2.42	$4.35

Louisiana annual average gas price is expected to be above $2 per MMBTU in the near future, and to increase to above $3 per MMBTU when demand increases from newly built plants in the state and when more LNG export terminals became operational.

TRANSFORMING THE NATION'S ELECTRICITY SYSTEM: THE SECOND INSTALLMENT OF THE QUADRENNIAL ENERGY REVIEW (PUBLISHED JANUARY 2017)

by
Patty Nussbaum

In June 2013, the federal government initiated a quadrennial cycle (every 4 years) of energy reviews. The reviews are intended to provide a roadmap for U.S. energy policy. The first Quadrennial Energy Review (QER)[1] focused on the nation's infrastructure for transporting, transmitting and delivering energy (TS&D Infrastructure). The second installment of the QER focuses on the electricity system.[2] It examines the electricity supply chain in the context of three goals:

1. Enhance economic competitiveness;
2. promote environmental responsibility; and,
3. provide for the nation's security.

Electricity System	Transmission lines and substations Distribution lines and distributed generation Electricity storage Other electric grid-related infrastructure

The second installment supports development of a Federal strategy for the electricity sector. It also identifies a number of trends that will shape the sector in the future.

- The changing generation mix
- Low load growth
- Increasing vulnerabilities to severe weather
- Proliferation of new technologies, services and market entrants
- Increasing consumer choice
- Emerging cyber/physical threats
- Aging infrastructure and workforce
- Growing interdependence of regulatory jurisdictions

Electricity supports the nation's critical infrastructure, which includes transportation, oil and gas production, water, communications and information, and finance. Below are some of the key findings from the report. To access the full report refer to footnote 2 for the link to the website.

- About 90 percent of the of the residential electricity consumption, 60 percent of commercial, and 30 percent of industrial is used in appliances and equipment that are subject to Federal minimum efficiency standards.
- Nuclear power provides 60 percent of U.S. zero-carbon electricity.

[1] U.S. Department of Energy (http://energy.gov/epsa/quadrennial-energy-review-qer)
[2] Quadrennial Energy review: Second Installment (https://www.energy.gov/epsa/downloads/quadrennial-energy-review-second-installment)

- Some energy technologies that reduce greenhouse gas emissions have the potential to increase energy's water intensity (for example, carbon capture, utilization, and storage) while others can lower it (for example, wind and photovoltaic (PV) solar power).
- There is no centralized permanent disposal facility used for nuclear fuel so this radioactive material is stored at reactor sites in 35 states.
- The reliability of the electric system underpins every sector of the U.S. economy.
- The time scales for power balancing have shifted from daily to hourly or less, with the potential to impact system frequency and inertia, as well as transmission congestion.
- Over 90 percent of electric power interruptions result from disruptions on the distribution system.
- Over 1.9 million people are employed in jobs related to electric power generation and fuels, while 2.2 million people are in industries directly or partially related to energy efficiency.

Recommendations to Support the Security and Reliability of the Electricity System

- Protect the electricity system as a national security asset – the clear and exclusive purview of the Federal Government – by amending the Federal Power Act to clarify and affirm the Department of Energy's (DOE's) capabilities to develop preparation and response capabilities.
- The U.S. grid faces danger from cyber-attack. Natural gas plays an important role as fuel for the electricity system so a cyber-attack that causes a gas pipeline outage or malfunction could also affect the reliability of the electricity system. Integrated security planning that covers the entire United States is necessary to ensure that there are no unnecessary vulnerabilities associated with state-to-state or utility-to-utility variations in protections.
- Increase financing options for grid modernization – the current DOE loan program should be expanded and made more flexible. Transmission projects can involve many entities and jurisdictions, and clarification is needed on lending authorities for multi-jurisdictional projects.
- Increase technology demonstrations and utility/investor confidence – the grid of the future requires a wide range of capital-intensive technologies. DOE needs a focused cost-shared program for utilities to demonstrate distribution system technologies at the community scale.
- Build capacity at the Federal, State and Local Levels – provide funding assistance to enhance analytical capabilities. These issues are highly technical and require human resources with a new knowledge base and skill set.
- Inform electricity system governance in a rapidly changing environment – DOE in collaboration with the National Association of Regulatory Utility Commissioners should establish a Federal advisory committee to examine and make recommendations regarding responsibilities for rates and resource adequacy.

HIGHLIGHTS OF THE 21ST EDITION OF THE LOUISIANA CRUDE OIL REFINERY SURVEY REPORT

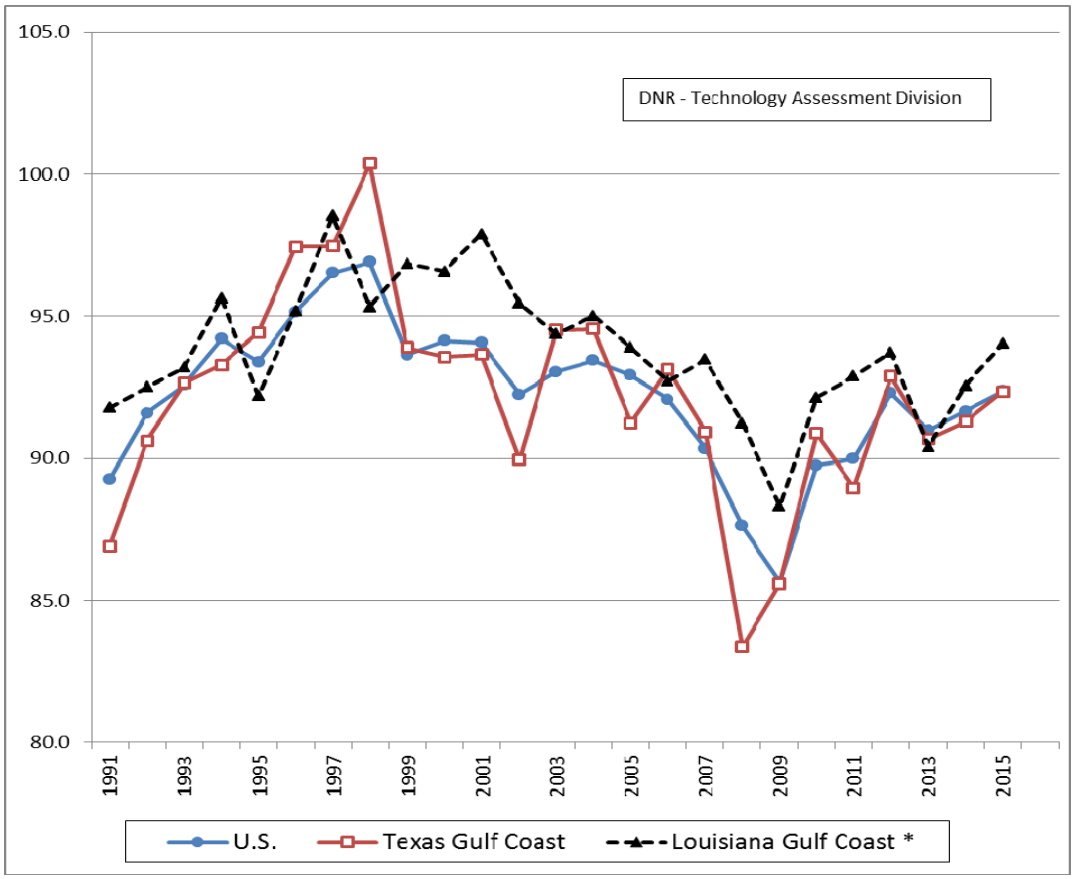
by

Manuel Lam

The 21st edition of the Department of Natural Resources (DNR) *Louisiana Crude Oil Refinery Survey Report* covers calendar year 2015. The 16 Louisiana refineries have a combined operating capacity of 3.30 million barrels per calendar day (MBCD), and the operating rate for that period was 88.9%. The total U.S. refinery-operating rate was 91.0% for the same period, with a combined operating capacity of 17,824 MBCD.

Louisiana's refinery capacity increased 17.7 MBCD from our last report. Louisiana refineries combined throughput for the 12-month period was 1.07 billion barrels. Marathon Petroleum Co., LLC at Garyville has the most refining capacity in Louisiana and it is the third largest refinery in the U.S. Table 1 shows the Louisiana operating refinery capacity and throughput information and Table 2 lists the top six refinery products based on percent of total refinery production from DNR's last survey. Motor gasoline remains the largest share of refinery production in Louisiana at about 40% of the total. The figure below shows the Louisiana Gulf Coast, Texas Gulf Coast, and total U.S. refinery operating rates since 1991.

Louisiana Gulf Coast, Texas Gulf Coast and U.S. Refinery Operating Rates (%)



Source: EIA, *Petroleum Supply Annual*, Vol. 1

The full report is available online in PDF format on the
Department of Natural Resources Technology Assessment Division website:
http://www.dnr.louisiana.gov/assets/TAD/reports/refinery_survey/RefineryReport_2015.pdf

Table 1. Louisiana Operating Refinery Capacity and Throughput

Refinery	Operating capacity as of 12/31/2015 (bcd)	Operating Capacity Change[1] (%)	Throughput 1/1/2015 - 12/31/2015 (Barrels)	Throughput Change[2] (%)
Alon Refining, Krotz Springs	80,000	0.00	21,341,528	-9.89
Calcasieu Refining, Lake Charles	89,000	11.25	30,096,060	13.57
Calumet Lubricants, Cotton Valley	13,020	0.00	2,609,570	8.66
Calumet Lubricants, Princeton	8,300	0.00	2,340,686	-3.38
Calumet Shreveport, Shreveport	57,000	-12.31	14,794,277	20.41
Chalmette Refining, Chalmette	192,500	0.00	59,452,851	9.65
Citgo Petroleum Corp, Lake Charles	427,800	0.00	145,557,024	3.12
ExxonMobil Refining & Supply Co, Baton Rouge	502,500	0.00	178,437,180	-0.57
Marathon Petroleum Co LLC, Garyville	539,000	3.26	198,013,588	4.38
Motiva Enterprises LLC, Convent	235,000	0.00	85,413,491	9.63
Motiva Enterprises LLC, Norco	237,700	-0.13	83,743,498	27.01
Phillips 66, Belle Chasse	247,000	0.00	65,453,007	-11.93
Phillips 66, West Lake	260,000	0.00	85,114,898	-4.14
Placid Refining Co, Port Allen	75,000	0.00	27,152,073	37.69
Valero Refining Co, Meraux	125,000	0.00	31,831,014	-13.64
Valero Refining Co, Norco	215,000	0.00	41,124,448	7.73
Totals	3,303,820		1,072,475,193	

1. Change from end date (1/31/2014) of previous DNR report to end date (12/31/2015) of 2015 DNR report.
2. Change from previous DNR report throughput (2014) to DNR report throughput (2015).

Table 2. Top Products from LA Refineries by % of Product Slate

Product	Total Product Slate (%)
Motor gasoline	38.8
Diesel fuel	23.6
Jet fuel	7.1
Residual/Coke	3.5
Gas mixture	2.5
Lubricants	0.7

E15 FUEL IN LOUISIANA

by
Edward O'Brien, III MBA, M.Ec.

In March, RaceTrac made Louisiana the 29th state to offer an alternative at the pumps, with the addition of E15 pumps in Baton Rouge. This newer grade of fuel has been on the market since 2012, and has slowly been making its way into gas stations across the United States. The Environmental Protection Agency (EPA) approved this brand of gasoline for use in passenger cars and light trucks newer than 2001 in 2011. Although E15 has been approved by the EPA, some organizations still have concerns over the potential damage done to engines, and an overall lack of acceptance from the public.

What Is E15

The "E" in E15 stands for ethanol. The "15" in E15 stands for the percentage of ethanol content blended into the gasoline that is put in the car, which, for E15, is 15 percent. The ethanol used for E15 gasoline is produced from corn via fermentation and distillation, and then blended with normal gasoline to the percentage of ethanol in the gasoline. The average consumer might not realize, but most of the gasoline sold in the United State right now has some ethanol component in it, usually not more than 10%. There are places that also sell ethanol-free gasoline, or basic, unblended gasoline. This unblended gasoline is marked clearly, and is marketed more towards engines with carburetors, which have been thought to develop problems when running gasoline blended with ethanol.

According to the Renewable Fuels Association, ethanol production has increased from 848 million gallons in 1990, to 14.8 billion gallons in 2015, a 17-fold increase in production in 25 years.[1] One reason behind this increase is the Renewable Fuel Standards, a federal program which deems that fuel sold in the United States contains a minimum amount of renewable fuel in the gasoline. The first standard, called the Energy Policy Act of 2005, started the requirement of blending renewable fuels into gasoline. The Environmental Protection Agency (EPA) oversees the program. The ultimate goal of this act, expanded in 2007 with the Energy Independence and Security Act of 2007, is to have 36 billion gallons of renewable fuel blended into the normal transportation fuel in order to help reduce the levels of Green House Gasses (GHGs) in the atmosphere.[2] E15 is becoming a more plentiful option for drivers around the country. Cars, light trucks, and flex-fuel vehicles made after 2001 are all approved to use E15 fuel or more than 80% of all vehicles currently on the road. Prices of E15 tend to be a little less expensive, averaging $0.02-$0.05 less than regular unleaded gasoline.[3] American drivers have driven over 750 million miles on E15, according to Growth Energy.[4]

Pros and Cons

But E15 is not without controversy. E15 has 33.3% less energy potential than unblended gasoline, thus, is not as efficient as gasoline energy-wise. In other words, you have to use more ethanol to go the same distance as you would for gasoline – for every 100 miles you use in energy with gasoline, you would

[1] http://www.houstonchronicle.com/business/article/Gas-stations-challenge-oil-industry-orthodoxy-on-9218266.php
[2] http://www.afdc.energy.gov/laws/RFS.html
[3] http://exchange.sigma.org/HigherLogic/System/DownloadDocumentFile.ashx?DocumentFileKey=04af086b-1ee4-d1e4-53ae-59b4a662ab97&forceDialog=0
[4] http://www.biofuelsdigest.com/bdigest/2017/03/19/louisiana-becomes-29th-state-to-adopt-e15-ethanol/

only have enough energy to go 67.7 miles with ethanol blended E15. Also, some warranties from automobile manufacturers do not cover E15 damage that might occur. One should check the vehicle owner's manuals or warranty statements before making a decision to try E15 fuel.[5]

Coupled with controversy are the positive ramifications to moving towards more ethanol-blended gasoline. Researchers at the University of Illinois have found that just changing from E10 to E15 saves 1.25 grams of carbon dioxide per megajoule, and that ethanol emissions are 34% less than regular gasoline[6] (one gallon has the energy equivalent of .76 of 1 percent of a megajoule). With approximately 143.37 billion gallons of gasoline consumed in 2016[7], about 1.09 billon megajoules were consumed and, using the consumption in 2016, a switch from E10 to E15 would save 1.36 million kilograms of carbon from being expended. With the reduction of hydrocarbons expended, the ethanol blended gasoline can help alleviate some of the air pollution problems within the United States. In addition, E15 has been claimed to keep engines cleaner by helping to dissolve foreign bodies.[8]

While E15 is not without its drawbacks, more and more states have started to, if not adopt E15 whole heartedly, at least offer it to the consumer. With the higher octane (usually 88 – regular gasoline is 87), E15 can save the consumer a few cents per gallon, while releasing fewer pollutants. While E15 comes with a higher octane than regular gasoline, before you decide to use it in a vehicle, it would be best to check in the owner's manual to ensure that your vehicle is E15 approved. There are more stations offering the E15 option, it is up to the consumer to make the decision if E15 is right for their vehicle.

[5] http://exchange.sigma.org/HigherLogic/System/DownloadDocumentFile.ashx?DocumentFileKey=04af086b-1ee4-d1e4-53ae-59b4a662ab97&forceDialog=0
[6] http://www.eesi.org/articles/view/research-finds-widespread-use-of-e15-would-reduce-co2-emissions
[7] https://www.eia.gov/tools/faqs/faq.php?id=23&t=10
[8] http://www.ethanolretailer.com/e15-resource-center/e15-performance

SELECTED LOUISIANA ENERGY STATISTICS

Among the 50 states, Louisiana's rankings (in 2016, unless otherwise indicated) were:

PRIMARY ENERGY PRODUCTION

(Including GOM Central OCS region)

- 2nd in crude oil
- 1st in OCS crude oil
- 1st in OCS natural gas
- 1st in OCS revenue generated for federal government
- 1st in mineral revenues from any source to the federal government
- 1st in LNG terminal capacity
- 3rd in natural gas
- 3rd in crude oil proved reserves
- 4th in natural gas proved reserves
- 4th in total energy from all sources

REFINING AND PETROCHEMICALS

- 2nd in primary petrochemical production
- 2nd in natural gas processing capacity
- 2nd in petroleum refining capacity

PRIMARY ENERGY PRODUCTION

(Excluding GOM Central OCS region)

- 9th in crude oil
- 4th in natural gas
- 7th in natural gas proved reserves
- 9th in crude oil proved reserves
- 18th in coal
- 18th in nuclear electricity

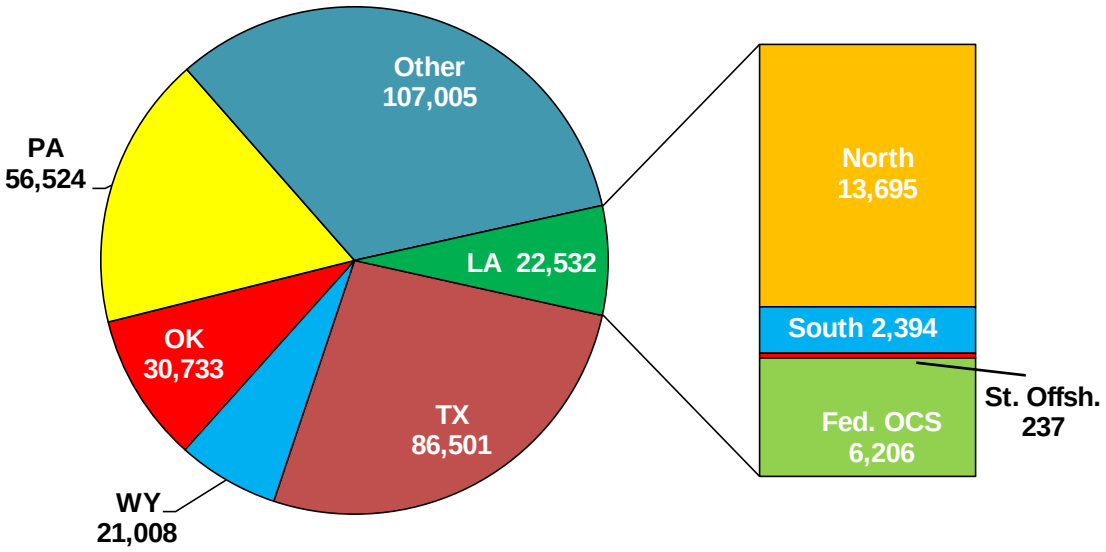
ENERGY CONSUMPTION (2015)

- 2nd in industrial energy
- 1st in per capita energy
- 3rd in natural gas
- 3rd in petroleum
- 3rd in total energy
- 26th in residential energy

Figure 1

2016 U.S. Natural Gas Reserves

(Billion Cubic Feet)

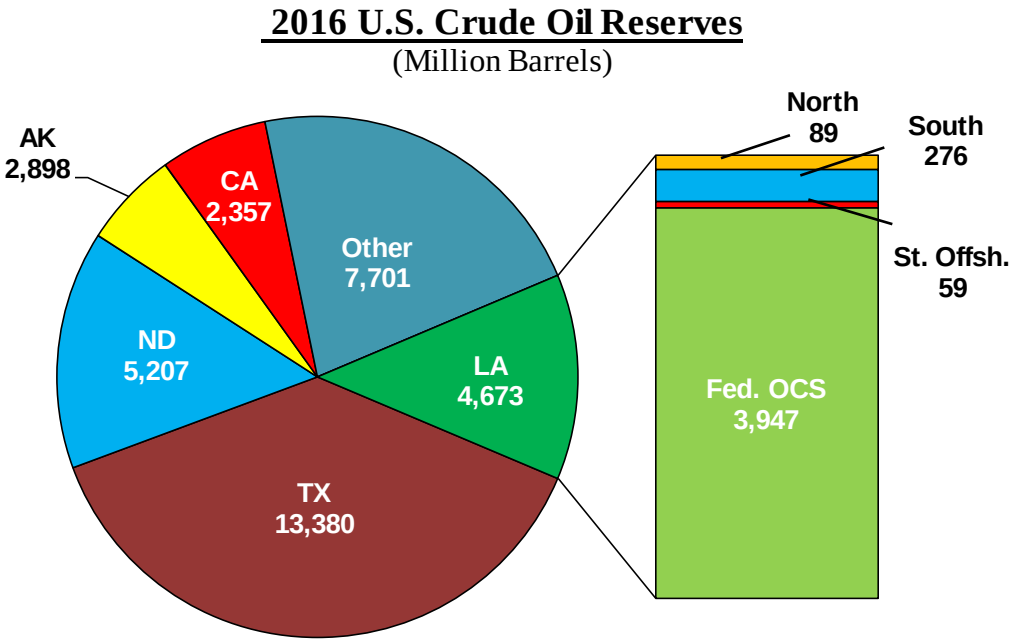


PRODUCTION

State controlled natural gas and casinghead gas production peaked at 5.6 trillion cubic feet (TCF) per year in 1970 and declined to 1.28 TCF in 2005. The trend started to reverse in 2006 when production increased to 1.35 TCF. The rising trend continued until 2011 when it peaked at 2.98 TCF. This production surge was due to production in the Haynesville shale play. Prior to the Haynesville discovery, the long-term decline rate was around 3.2% per year. With the start of production in Haynesville in 2007, the state production has shown an increase of 0.3% in 2008 over the previous year, 12.4% in 2009, 42.3% in 2010, and 37.1% in 2011. In 2012, production fell to 2.96 TCF; in 2013, it fell to 2.31 TCF; in 2014, it fell to 1.94 TCF; in 2015, it fell to 1.78 TCF; and in 2016, it fell to 1.72 TCF or a 3.2% drop from the previous year. This decline is expected to continue as long as prices continue to be below $3.50 per MCF and storage gas level remains high.

State controlled crude oil and condensate production peaked at 566 million barrels (mmbls) per year in 1970, declined to 211 mmbls in 1980, declined to 148 mmbls in 1990, declined to 107 mmbls in 2000, and declined to 68 mmbls in 2010. Then in 2011, oil production reversed its trend; 2011 production was 69 mmbls, in 2012 it increased to 71 mmbls, in 2013 it increased to 72 mmbls, in 2014 it decreased to 69 mmbls, in 2015 it decreased to 63 mmbls, and in 2016 it decreased to 57 mmbls. The oil production decrease is caused by declining oil prices and low drilling activities. If oil prices stay below $65 per barrel, production is expected to decrease from the present level, but if the Tuscaloosa Marine Shale, the Brown dense shale, or enhance recovery in older fields' productions increase, state oil production might reverse the declining trend.

Figure 2



Gulf of Mexico (GOM) Central OCS region is the most extensively developed and mature OCS territory in the U.S. It has produced approximately 89% of the 22 billion barrels of crude oil and

condensate and 82% of the 181 TCF of natural gas extracted from all federal OCS territories, from the beginning of offshore production through the end of 2016.

In 2016, GOM Central OCS region produced 16.5% and the state territory produced 1.7% of the U.S. oil domestic production. The GOM Central OCS region produced 3.9% and the state territory produced 6.2% of the natural gas produced in the U.S.

GOM Central OCS region gas production first peaked at 4.10 TCF per year in 1981, then declined to 3.00 TCF in 1986, started to recover as prices increased, reaching a second peak at 4.11 TCF in 2010. Production then slowly started to decline, caused first by the moratorium on deep water drilling and later by the decline in price and increased gas shale production. In 2014, it produced 1.14 TCF; in 2015, it produced 1.07 TCF; and in 2016, it produced 1.09 TCF.

GOM Central OCS region crude oil and condensate production first peaked at 374 mmbls per year in 1972 and then declined to 249 mmbls in 1981. The production rose from 248 mmbls in 1990 to 524 mmbls in 2001, due to the development of deep water drilling. In 2008, production dropped to 396 mmbls due to weather; in 2009, production reached its second peak at 544 mmbls; in 2011, production began to slow down after the Macondo oil spill and subsequent moratorium, but by 2014, production was on the upswing with discovery of deep oil reservoirs. The Central OCS produced 470 mmbls in 2014, 514 mmbls in 2015, and 534 mmbls in 2016.

REVENUE

In Fiscal Year (FY) 2007/08, oil and gas revenue (severance tax, royalties, and bonuses) reached an all time high of $1.94 billion, or 16% of state income (total state taxes, licenses, and fees); the previous peak occurred in FY 1981/82 at $1.62 billion, but it was 41% of state income. In FY 2012/13, it was $1.37 billion or 13% of the state income; in FY 2013/14, it was $1.32 billion or 13% of state income; in FY 2014/15, it was $1.01 billion or 10% of state income; and, in FY 2015/16, it is expected to be around $707 million.

DRILLING ACTIVITY

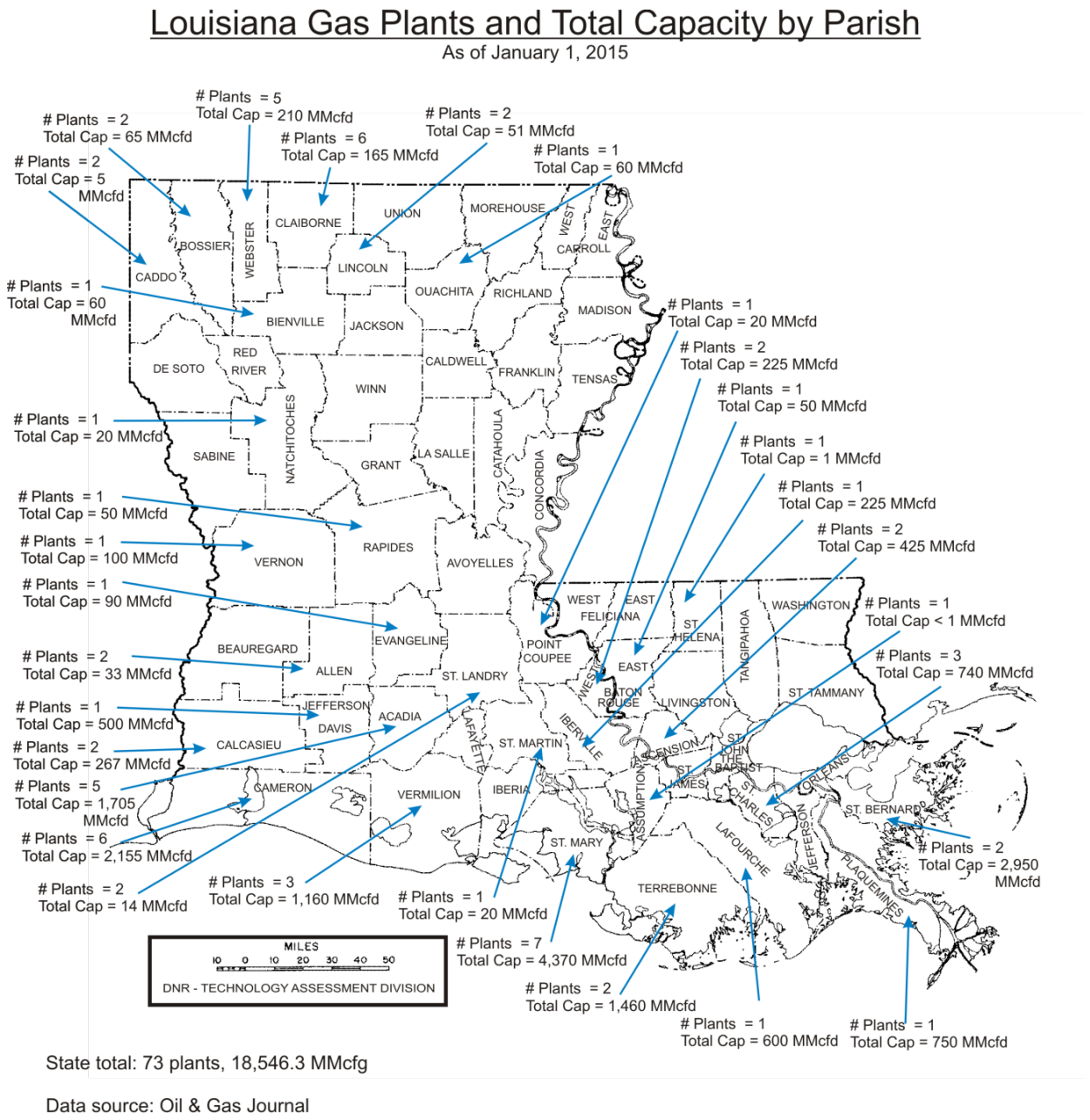
Drilling permits issued on state controlled territory peaked at 7,631 permits in 1984 and declined to a low of 1,017 permits in 1999. Since 2000, the annual number of drilling permits issued has been on a roller coaster ride. In 2008, they increased to 2,374 permits; in 2009, permits decreased to 1365; in 2010, they increased to 1,956 permits; in 2013, they decreased to 1,578 permits; in 2014, they decreased to 1,408 permits; in 2015, they decreased to 643; and, in 2016, they decreased to 475.

The average active rotary rig count for Louisiana, excluding OCS, reached a high of 386 active rigs in 1981 and fell to 76 active rigs in 2002. In 2008, there was an average of 117 active rigs. The count fell to 113 rigs in 2009. It increased to 166 active rigs in 2010 because of Haynesville run up; in 2014, it decreased to 60 active rigs due to competitions from shale productions; in 2015, the count decreased to 44 rigs; and, in 2016, it decreased to 26 rigs due to low oil and gas prices. The lowest year average between 1981 and 2010 was 64 active rigs in 1993.

- Note: **GOM Central OCS** (Outer Continental Shelf) region is the federal offshore territory adjacent to Louisiana's coast beyond the three-mile limit of the state's offshore boundary and includes Alabama federal offshore production.

The annual average active rotary rig count for GOM Central OCS region reached a high of 109 rigs in 2001 and it is in a downward trend; it was 70 rigs in 2006, 50 rigs in 2008, and 26 rigs in 2010. After the moratorium, the trend reversed; in 2013, it increased to 47 rigs; in 2014, it increased to 51 rigs; but, in 2015, it reversed to 33 rigs; and, in 2016, it decreased to 21 rigs. The lowest year average between 1981 and 2010 was 23 active rigs in 1992.

Figure 3



State total: 73 plants, 18,546.3 MMcfg

Data source: Oil & Gas Journal

LOUISIANA, AN ENERGY CONSUMING STATE: AN UPDATE USING 2015 DATA

by
Manuel Lam

Louisiana ranks high among the states in overall energy consumption. Louisiana ranked third in total energy consumption in 2015 and 2014; it was ranked fifth in 2013. Louisiana was ranked first in per capita energy consumption in 2015. The main reason for Louisiana's high energy consumption is the extremely energy intensive petrochemical and petroleum refining industry that is located in the state and slow growth in population. The abundance of Louisiana's natural resources has historically meant low energy prices, which have attracted a large cluster of energy intensive industries to the state. Figures 1 & 2 below show Louisiana energy consumption by sector and source. The large amount of energy consumed by the petrochemical and petroleum refining industry is reflected in the high percentage for the industrial sector and the high percentages for natural gas and petroleum.

Figure 1. Louisiana Energy Consumption Percentage by Sector - 2015

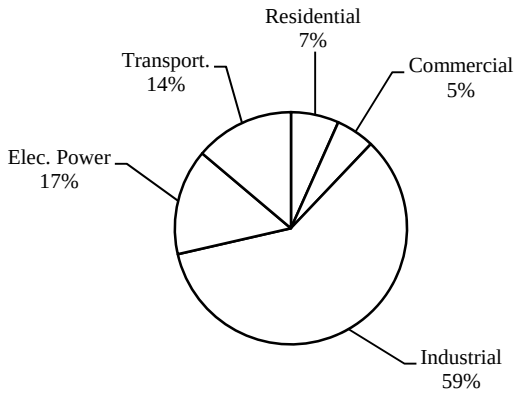


Figure 2. Louisiana Energy Consumption Perecentage by Source - 2015

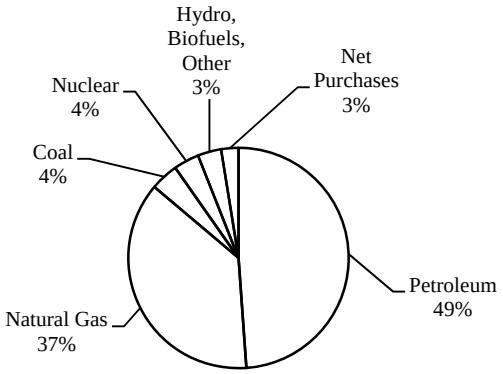


Table 1 shows where Louisiana ranks among the states in various energy consumption categories and lists the top energy consuming state for each category.

Louisiana is also a large producer of energy, mainly in the form of crude oil and natural gas. Table 2, on the following page, presents the Louisiana energy balance for 2015. The energy balance is calculated both inclusive and exclusive of Central Gulf of Mexico federal waters oil and gas production.

Table 1. Louisiana Energy Consumption Rankings Among the States - 2015

Category	Rank	TBTU	#1 State (TBTU)
Residential	26	333.9	Texas (1,696.3)
Commercial	24	270.0	Texas (1,592.4)
Industrial	2	2,963.6	Texas (6,458.5)
Transportation	13	691.4	Texas (3,150.3)
Coal	31	174.2	Texas (1,340.4)
Natural Gas	3	1,589.5	Texas (4,267.4)
Petroleum	3	2,100.9	Texas (6,291.8)
Electricity	14	312.8	Texas (1,338.7)
Total	3	4,258.9	Texas (12,897.8)
Per Capita (MBTU)	1	912.2	Louisiana(912.2)

Table 2. Louisiana Energy Balance - 2015 [1]

ENERGY SOURCE		PRODUCTION	CONSUMPTION	NET STATE ENERGY PRODUCTION Excluding OCS	NET STATE ENERGY PRODUCTION Including OCS
PETROLEUM:	STATE OIL[2]	366.0 TBTU[4] (63.1 MMBBL)	2,080.8 TBTU (441.4 MMBBL)	-1,714.8 TBTU	1,268.5 TBTU
	CENTRAL GOM OCS OIL[2]	2,983.3 TBTU[4] (514.4 MMBBL)			
NATURAL GAS:	STATE GAS[3]	1,792.2 TBTU[4] (1.759 TCF)	1,589.0 TBTU (1.518 TCF)	203.2 TBTU	1,295.4 TBTU
	CENTRAL GOM OCS GAS[3]	1,092.2 TBTU[4] (1.072 TCF)			
COAL:	LIGNITE	31.1 TBTU[4] (2.363 MMSTON)	174.2 TBTU (12.8 MMSTON)	-143.1 TBTU	-143.1 TBTU
	POWDER BASIN COAL (Imports)	-143.1 TBTU (10.4 MMSTON)			
NUCLEAR ELECTRIC POWER		160.0 TBTU (15.3 Billion kWH)	160.0 TBTU (17.3 Billion kWH)	0.0 TBTU	0.0 TBTU
HYDROELECTRIC, BIOFUELS & OTHER		154.9 TBTU	146.8 TBTU	8.1 TBTU	8.1 TBTU
NET INTERSTATE PURCHASES OF ELECTRICITY INCLUDING ASSOCIATED LOSSES			108.1 TBTU	-108.1 TBTU	-108.1 TBTU
TOTALS:	Excluding Central GOM OCS	2,504.2 TBTU	4,258.9 TBTU	-1,754.7 TBTU	
	Including Central GOM OCS	6,579.7 TBTU	4,258.9 TBTU		2,320.8 TBTU

The Louisiana energy balance for 2014 shows that the state consumed 1,538.4more TBTUs of energy than it produced if Central GOM OCS production is not included. If Central GOM OCS production is included, the state is a net producer of energy by 2249.9 TBTUs.

TCF = Trillion Cubic Feet
TBTU = Trillion BTU's
MMBBL = Million Barrels
GOM = Gulf of Mexico
kWH = Kilowatt hour
MMSTON = Million Short Tons
OCS = Outer Continental Shelf (federal waters seaward of the state's 3-mile offshore boundary)

1. Unless otherwise noted, data is obtained from the Energy Information Administration's latest published figures for state energy consumption.
2. Includes condensate
3. Includes gas plant liquids
4. Louisiana Department of Natural Resources data

MARGINAL WELLS ARE NOT INSIGNIFICANT

by
Edward L. O'Brien, III, MBA, M.Ec.

Marginal wells compose 69% of all producing oil wells in the United States, and 76% of all producing natural gas wells. In Louisiana in 2015, there were 20,576 oil wells that were considered marginal producers, pumping out 9 million barrels, or 14.3% of the state total of 62,861,269 barrels produced. For natural gas, Louisiana had 15,449 marginal wells, which produced 56,865,395 Mcf for the year, representing 3.2% of all natural gas production.[1] While the name "marginal" may connote something of secondary importance, the production from these wells is anything but that.

Marginal Wells

Oil

Marginal wells, also known in some circles as stripper wells, are wells that the maximum daily average oil production does not exceed 10 bbls of oil, or any natural gas well that the maximum daily average gas production does not exceed 250 Mcf, per day, during any 12-month consecutive period in Louisiana.[2] Marginal wells may have originally been high-volume wells, but through normal production declines, now produce smaller volumes. Some of the wells considered marginal have been producing for decades; these wells tend to have low maintenance costs, are kept active, and they may continue to produce for many years, as long as they are economically feasible. Typically, these wells paid out many years ago. While each well contributes a small volume to the amount produced, the magnitudes of wells considered marginal contribute a significant amount of oil and natural gas production. In fact, in Louisiana alone, marginal wells represent 14.3% of oil production, and marginal wells account for 11.2% of all oil production in the United States (see Table 1). In fact, Louisiana produces 3.1% of all the marginal oil production in the country.

Table 1. Marginal Oil Wells in the United States

State	Number of Maginal Oil Wells	Oil Production from Marginal Wells	Average Daily Production per Well (bbl)	Total Oil Production (bbl)	Marginal Share of Total Production
Louisiana	20,576	8,996,596	1.2	62,861,269	14.31%
Oklahoma	28,351	15,188,479	1.5	157,770,000	9.63%
Mississippi	992	1,170,601	3.2	23,659,686	4.95%
USA	408,490	292,529,299	2	2,613,488,988	11.19%
Louisiana Share	5.04%	3.08%		2.41%	

http://iogcc.ok.gov/Websites/iogcc/images/MarginalWell/MarginalWell-2015.pdf

Putting the value of that production into monetary terms, when looking at just the value of the oil severed from the ground and not the additional economic benefit of employment, West Texas Intermediate (WTI) averaged $49 per barrel in 2015. Multiply the $49 per barrel by the nearly 9 million

[1] http://iogcc.ok.gov/Websites/iogcc/images/MarginalWell/MarginalWell-2015.pdf
[2] http://revenue.louisiana.gov/TaxForms/9051(5_10)F.pdf

barrels of production from marginal wells in Louisiana and there was over $440 million worth of oil produced from marginal wells in Louisiana alone. Taking into consideration all marginal well production, 292.5 million barrels, and the production alone was valued at $14.3 billion. In addition to the production revenue generated by extraction, there is also an economic benefit to the states and to the employees of the companies, which sever the oil. Severance tax for marginal wells (in Louisiana, Incapable Wells are the subset of marginal wells which produce an average between 10 and 25 barrels per day while Stripper Wells produce an average of 10 or fewer barrels per day) pay a lesser percentage of severance tax than high producing wells. Incapable well production is taxed at a 6.25% rate, and stripper well production is taxed at a 3.125% rate.[3] The lower tax rate could be construed as an incentive to continue production for wells that have neared the end of their lifespan, albeit at a declined rate.

Natural Gas

As for natural gas, Louisiana produces almost 57 million Mcf from marginal wells, or about 3.25% percent of all natural gas produced in the state. That 57 million Mcf represents 2.91% of all natural gas produced from marginal wells in the United States. Seven percent of the 28 billion Mcf of natural gas produced in the United States was from marginal wells in 2015 (see Table 2), a lower percentage of marginal production than the 11.19% of oil produced from marginal wells. Louisiana produces 6.28% of all natural gas in the United States, spurred on by the Haynesville Shale, located in Northwest Louisiana (mainly in Bossier and Caddo Parishes).

Table 2. Marginal Natural Gas Wells in the United States

State	Number of Maginal Gas Wells	Gas Production from Marginal Wells	Average Daily Production per Well (Mcf)	Total Gas Production (Mcf)	Marginal Share of Total Production
Louisiana	15,449	56,865,395	10.1	1,754,317,208	3.24%
Oklahoma	45,340	310,610,973	18.8	2,499,599,000	12.43%
Mississippi	1,475	1,335,810	2.5	55,166,000	2.42%
USA	377,977	1,955,292,380	14.2	27,924,277,063	7.00%
Louisiana Share	4.09%	2.91%		6.28%	

http://iogcc.ok.gov/Websites/iogcc/images/MarginalWell/MarginalWell-2015.pdf

Putting a monetary value on just the production from natural gas extraction from marginal natural gas wells, Natural gas average price (per Mcf) was $2.62. Multiply that number by the 56,865,395 (the production of natural gas from marginal wells in Louisiana) and that produces $148,987,335 worth of production of natural gas from marginal wells in Louisiana. Taking into account all the natural gas marginal well production in the United States for 2015, the production value of the 1,955,292,380 Mcf was $512,286,603,560. In Louisiana, marginal natural gas wells, like oil, have a lower percentage of severance tax, as production from incapable wells is taxed at $0.013 per Mcf. Incapable wells are defined as a natural gas well that is incapable of producing an average of 250,000 cubic feet of gas per day. To qualify for the reduced rate, a gas well must be incapable of producing 250,000 cubic feet of gas per day during the entire taxable month.[4]

[3] http://www.dnr.louisiana.gov/assets/TAD/data/severance/la_severance_tax_rates.pdf
[4] http://www.dnr.louisiana.gov/assets/TAD/data/severance/la_severance_tax_rates.pdf

OCTOBER IS ENERGY AWARENESS MONTH

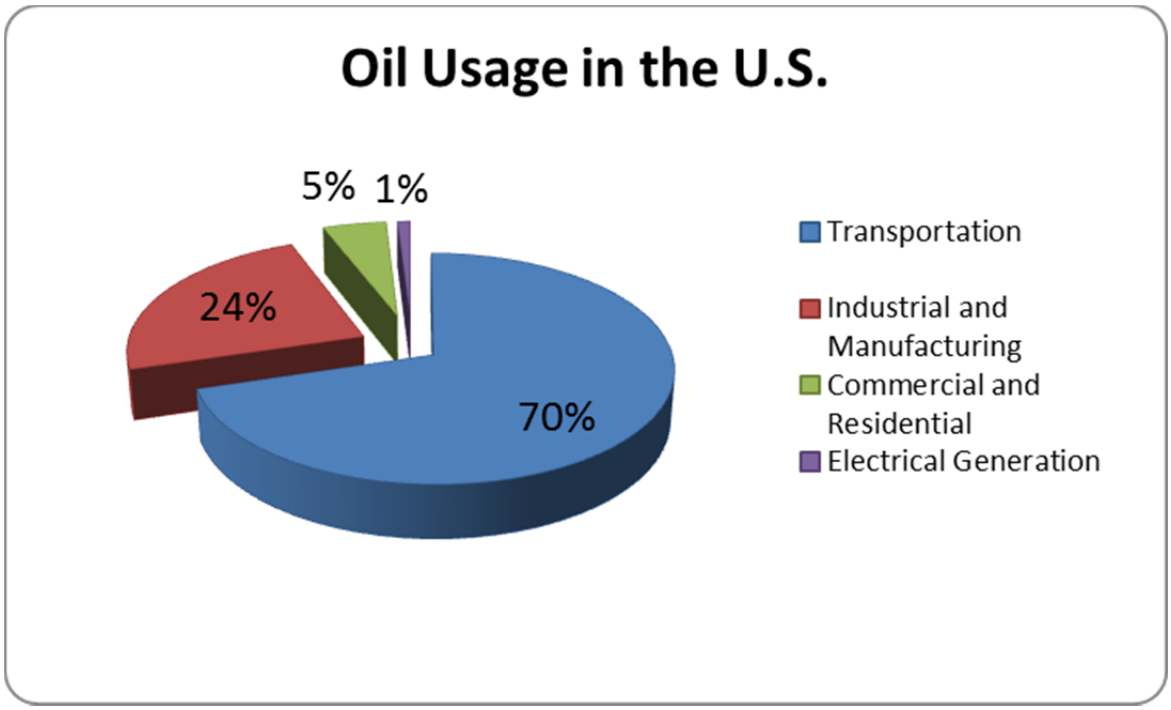
by

Edward L. O'Brien, III, MBA, M.Ec.

October is National Energy Awareness Month. Observed since 1991, President George H. W. Bush installed it to encourage governmental organizations to raise the visibility of the importance of conservation, sustainability, and awareness of the importance of managing the nation's energy resources in a responsible way. Promoted by the Department of Energy each year in October, National Energy Awareness Month is the public promotion of understanding of our energy needs and some simple ideas that everyone can use to reduce their energy footprint by reducing waste.

Looking at the United States, as a nation, we are less dependent on foreign oil than we have been since the 1970s. In 2016, the United States produced 14.6 million barrels per day of petroleum, and it consumed 19.6 million barrels a day of petroleum. Imported oil represents about 25% of all oil consumed in the United States[1], with Canada accounting for 38% of the imports; more than triple the 11%, imported from Saudi Arabia.[2] Breaking down the uses for oil, 71% is used for transportation, 24% is used for industrial and manufacturing purposes, 5% for commercial and residential use, and less than 1% is used for electrical generation[3] (see Table 1).

Table 1: Usage of Oil

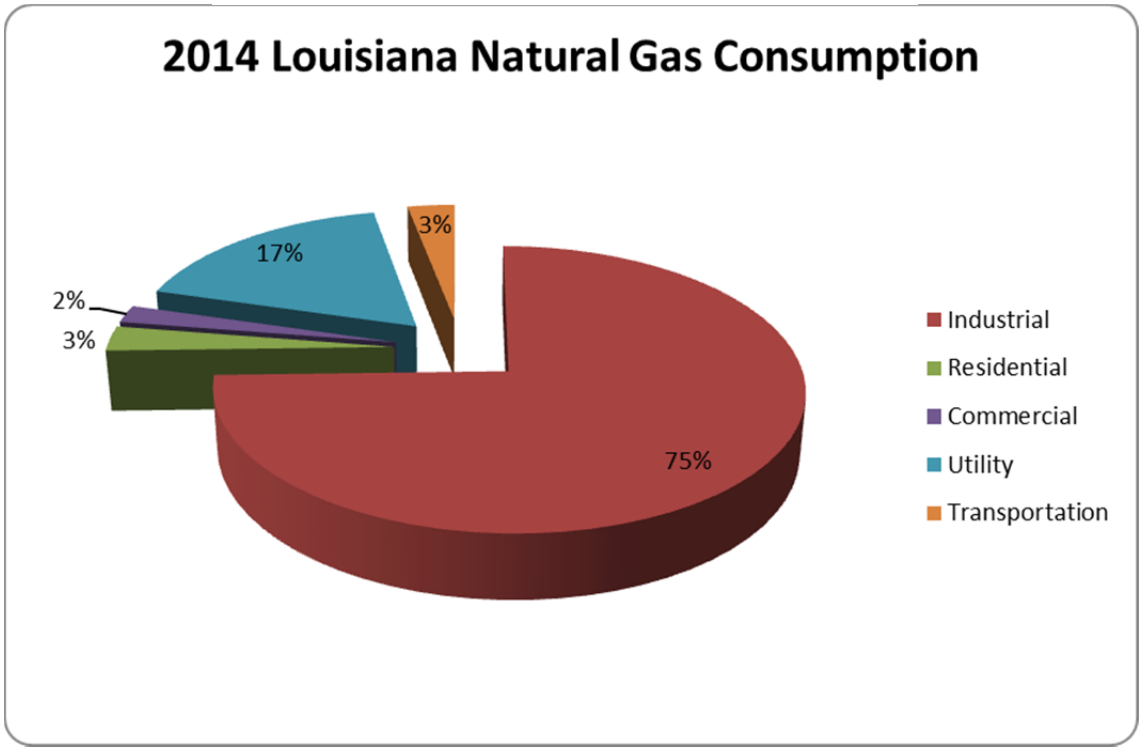


Source: http://instituteforenergyresearch.org/topics/encyclopedia/petroleum/

[1] https://www.eia.gov/energyexplained/index.cfm?page=oil_imports
[2] https://www.eia.gov/energyexplained/index.cfm?page=oil_imports
[3] http://instituteforenergyresearch.org/topics/encyclopedia/petroleum/

In 2016, about 91% of all energy production was from domestic sources.[4] This could not have been accomplished without the technological improvements within the oil and natural gas businesses, with one of the main improvements being the utilization of hydraulic fracturing, better known as fracking. A major portion of the natural gas produced and utilized in Louisiana was for industrial use, electrical generation, and in recent years, liquefied natural gas conversion. In fact, Louisiana is the fifth largest producer of natural gas in the United States at 1.94 trillion cubic feet (TCF) in 2014[5], with much of that total coming from North Louisiana's Haynesville Shale, and an additional 1.04 TCF coming from the Outer Continental Shelf. Louisiana consumed 1.52 TCF, so the state as a whole was a net exporter of natural gas. Consumption in Louisiana is dominated by industry with 75% of usage, followed by utilities (electrical generation) at 17%, and residential, transportation, and commercial coming in between 2% and 3% each (see Table 2).

Table 2: Louisiana Natural Gas Consumption



http://www.dnr.louisiana.gov/assets/TAD/newsletters/energy_facts_annual/LEF_2016.pdf

The worldwide adoption of energy efficient appliances and equipment would reduce global electricity consumption by more than 10 percent, save $350 billion in electricity bills and reduce global carbon emissions by 1.25 billion tons per year.[6] Energy Star is perhaps the most famous international standard to signify energy efficient products. Developed in the 1990s by the Environmental Protection Agency and the United States Department of Energy, it has been adopted in countries across Asia, Europe, North America, and Australia. Energy Star products tend to use 20% - 30% less energy than required by law.

In recent years, light-emitting diodes (LEDs) are another breakthrough toward lighting that is more efficient and consumes less energy. LED lighting typically lasts 25 times longer than traditional

[4] https://www.eia.gov/energyexplained/?page=us_energy_home
[5] http://www.dnr.louisiana.gov/assets/TAD/newsletters/energy_facts_annual/LEF_2016.pdf
[6] http://www.ase.org/blog/welcome-october-celebrating-national-energy-awareness-month

incandescent bulbs and uses 75% less energy, while it has a higher up-front cost.[7] In 2012, the normal cost of LED bulbs could be $25 or more, a price that was off-putting for the average consumer. Now, however, with rebates and other incentives, it is not uncommon for the average price to be under $2.50, or 1/10th the cost of just five years ago. Technology and improvements in manufacturing have made this lower price point possible. The LED bulb's additional price is made up in under a year in this scenario.

There has been much done in recent years to improve the efficiency of the products we use everyday. As technology improves, and the devices we use become more compact, the amount of electricity to run them has decreased. From light bulbs, which can be more than 75% more efficient then incandescent, to the transformation from the old vacuum tube televisions of yesteryear, to the LCD televisions of today, modern appliances, especially ones with the Energy Star label, use less energy than in the past. Not only can utilizing energy efficient devices save money, but it also helps to save our natural resources.

[7] https://energy.gov/energysaver/how-energy-efficient-light-bulbs-compare-traditional-incandescents

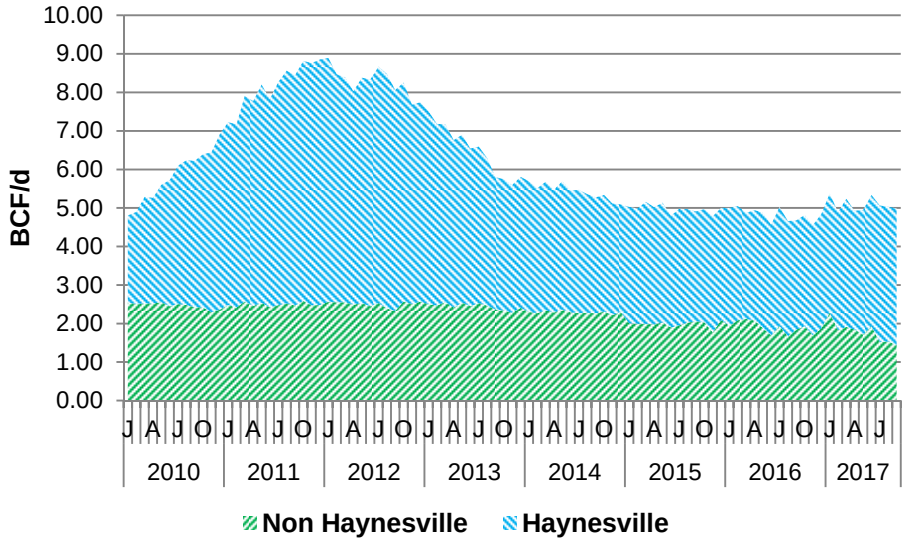
LOUISIANA STATE GAS PRODUCTION

by

Manuel Lam

Louisiana has been producing natural gas since the early 1900's. State gas production peaked in 1970 at 15.3 Billion Cubic Feet per day (BCF/d) and declined until 2005, reaching the bottom at 3.3 BCF/d. It then reversed its trend, thanks to production from Haynesville shale play. The Haynesville shale play is a layer of sedimentary rock more than 10,000 feet below ground in northwestern Louisiana, southwestern Arkansas, and eastern Texas, with some of the play stretching well across the northern central portion of Louisiana. Energy companies explored the shale play and drilled for crude oil and natural gas based on the potential of large supplies of oil or gas trapped within some portions of the shale play. Shale plays were once considered too costly, requiring large amounts of ground water to explore, but with improved equipment, less expensive technology in horizontal drilling, 3-D seismic, processes that are more efficient, and the ability to recycle used water have changed that.

Figure 1. Louisiana State Gas Production, Excluding Federal OCS



Louisiana's gas production average daily rate, from 2010 to present, is shown in Figure 1. The Louisiana Haynesville Shale was producing more gas than the rest of the state by March 2010. In December 2011, Louisiana Haynesville production reached a record high of 6.5 BCF/d. In early 2013, as natural gas prices started to decrease, natural gas production in the Haynesville region was surpassed by production in the newly developed Marcellus and Utica Shale plays. These plays are located 6,000 to 6,500 feet below the surface, hence are cheaper to develop than are those in Haynesville. In late 2015, natural gas prices started to decrease to below $2 per MMBTU, while oil prices remained above $30 per barrel. The Louisiana Haynesville gas production was also surpassed by gas production from oil shale wells in the Eagle Ford and the Permian regions in Texas.

Figure 2. Louisiana State Gas Drilling Rigs
by Baker Hughes vs. Spot Gas Price

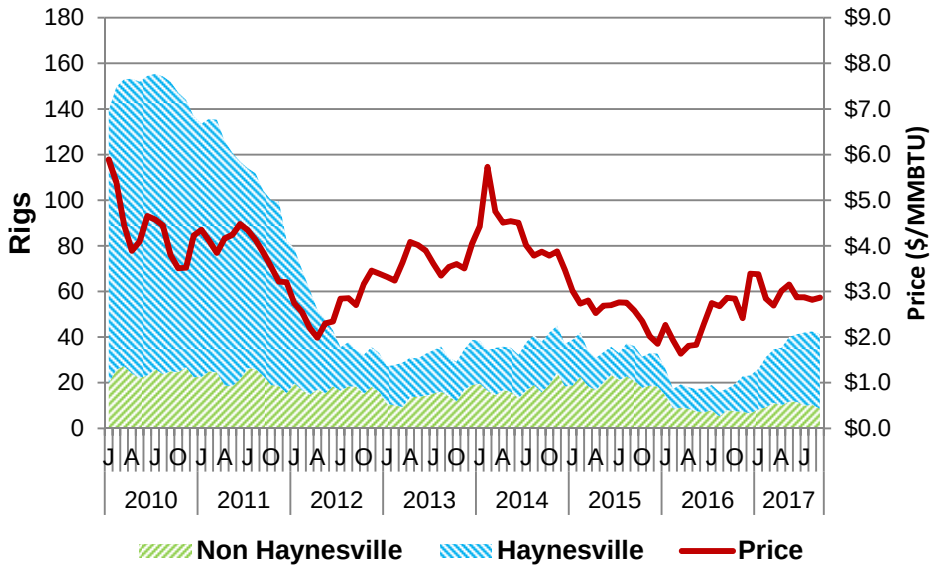


Figure 2 shows the relationship between gas prices and drilling rigs in Louisiana, excluding the federal OCS areas. Historically, the data was highly correlated with a lag around 12 months, but from 2013 thru 2016, this relationship was broken. During those years, production in the Louisiana Haynesville shale remained constant, despite the number of drilling rigs shrinking, due to well production from new wells in the Haynesville increasing since 2013. The production increase can be attributed to some of the following improvements in drilling technology:

- Longer laterals. In the late 1980's, a small diameter 1,000 meters drilled crossing was a considerable achievement, but with the development of bigger and better rigs, improvement in drilling bits and drilled rock strengths, now pushing lengths in excess of 4,000 meters, are being achieved.
- Directional drilling. Usage of geo-steering, a new technology in horizontal directional drilling used to keep a wellbore in a particular section of a reservoir to minimize gas or water breakthrough and maximize economic return, and to reach a larger area from one surface drilling location.
- Increased drilling rates and drilled pipe diameters. A new design in rotary steering systems and mud motors maximize rates of penetration and minimize downtime, and the high torque capability of new rigs let them use larger diameter drill pipe and hole-opening equipment (drills pipe diameters 42", 48", 54" and 60" have become the new norm).

Since late 2016, the correlation between price and drilling rigs are in sync again. The recent increase in drilling activity has increased Louisiana gas production in the Haynesville shale plays. This production increase can be attributed to an increase in demand from new industrial activities, expansion of existent gas plants, increasing gas usage in electric generations, and expectation of LNG exports.

The EIA's October 27, 2017 Today in Energy article, "Haynesville Shale Gas Production Increases to Highest Levels since End of 2013," reported, "Recent increases in drilling activity and well production

rates are raising natural gas production levels in the Haynesville region, according to EIA's Short-Term Energy Outlook (STEO). Marketed natural gas production in Haynesville reached 6.9 billion cubic feet per day (BCF/d) in September after remaining near 6.0 BCF/d for the previous three years. The recent growth in Haynesville natural gas production is attributable to an increase in the number of active drilling rigs (starting late in 2016) and a trend toward higher per-well initial production rates.

"The United States Geological Survey estimates that the Haynesville shale play holds 174.6 trillion cubic feet of technically recoverable shale gas resources, the second-largest level in the United States after the Appalachia region.

"Compared with Appalachian resources, Haynesville natural gas reservoirs are farther underground. Most Haynesville producing wells are in areas where the formations have depths ranging from 10,000 feet to 14,000 feet below sea level. In the Appalachian region, wells are in areas where formations are 2,000 feet to 12,000 feet below sea level. Haynesville shale formation thickness is also slightly narrower, ranging from 100 feet to 350 feet, compared with Appalachia where shale thickness ranges from 50 feet to 400 feet.

"From 2009 to 2012, the Haynesville region was the largest shale gas-producing region in the country. In November 2011, Haynesville regional production reached a record high of 10.4 BCF/d. In early 2013, however, as natural gas prices started to decrease, natural gas production in the Haynesville region was surpassed by production in the Appalachian region, which includes the Marcellus and Utica formations. By late 2015, shale gas production from relatively liquids-rich areas, such as the Eagle Ford region in Texas and the Permian region, which spans parts of western Texas and eastern New Mexico, also started to surpass production from the Haynesville region."

Note: The production volumes in the EIA's article are reported for the whole Haynesville play (Louisiana Haynesville and Texas Haynesville), while the first part of the report refers only to Louisiana Haynesville.

Notes

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Louisiana Department of Natural Resources

Technology Assessment Division
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Baton Rouge, LA 70804-9396

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