

Annual Retail Propane Sales Report

U.S. Odorized Propane Sales by State and End-Use Sector

Reporting Year: 2017

Conducted by ICF on behalf of the Propane Education & Research
Council

Published: February 2019



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ICF worked with PERC to define the parameters of the data collection process and estimation of the U.S. total retail propane sales covering the calendar year 2017. This information was collected from participating retail propane companies during 2018. ICF determined and developed the Annual Retail Propane Sales Report data verification, quality control, and estimation methodology based on industry best practices and ICF's internal expertise in an effort to minimize any bias or estimation errors arising from the collected information. ICF makes no assurances as to the accuracy of any such information or any conclusions based thereon.

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Executive Summary

U.S. Retail Propane Sales by Region

In 2017, U.S. retail (odorized) propane sales totaled 8.2 billion gallons, sold by nearly 4,000 active propane retailers. The 2017 U.S. sales total is 4.5% below the ten-year average of 8.6 billion gallons of odorized propane volumes per year.¹ The 2017 regional propane sales totals are shown in the figure below.



During 2017, the U.S. was mildly colder year-on-year, and with a 2% increase in heating degree days (HDDs), despite being the third warmest year on record according to NOAA. However, across the U.S. weather varied by region, in some cases sharply. Below is a brief summary for each region of major year-on-year changes that would influence retail propane sales:

- The **Midwest** accounted for 37.6% of total U.S. propane sales. In 2017, the region was 2% colder year-on-year, however, 2016 was a historically warm year and the region was nearly 9% warmer than the 20-year average.

 - Residential sales were 59% of total sales, or 1,829 million gallons. Year-on-year changes in sales are driven by winter weather, given the high space heating loads and relatively unchanged number of residential households using propane over the past five years. Agriculture sales totaled 548 million gallons, representing 18% of total regional sales.
- The **South** accounted for 26.8% of total U.S. propane sales. In 2017, the region had one of the warmest winters, with HDDs 7% lower year-on-year and 19% below the 20-year average. There were also likley impacts from hurricanes and flooding.

 - Residential sales were 44% of total sales, or 959 million gallons. Propane lost additional market share to electricity as a primary space heating, with a net decline of 8% over the past five years in households using propane. The South averaged 207 gallons sold per residential account, a level 43% below the U.S. average.
- The **West** accounted for 17.9% of total U.S. propane sales. In 2017, the region was 7% warmer year-on-year and was nearly 9% warmer than the 20-year average.

¹ Odorized propane volumes are estimated based on PERC Assessment Collections.

- Residential sales were 48% of total sales, or 699 million gallons. Commercial and Industrial sales trend higher than the U.S. average, totalling 500 million gallons, with 268 million gallons sold in the other sectors.
- The **Northeast** accounted for 17.7% of total U.S. propane sales. In 2017, the region was 2% colder year-on-year but continued to experience warmer than normal winter conditions across nearly all states, and was 7% warmer than the 20-year average.
 - The Northeast has the highest share of residential sales, accounting for 60% of total sales, or 877 million gallons. Use of propane as a primary heating fuel in the region continues to benefit from a stronger new construction market and conversions to propane from fuel oil oil, with total households using propane for primary heating increasing by 22% over the past five-years.

Top Ranked States by Retail Propane Sales

In 2017, the top 10 states by total retail sales accounted for 46.5% of total U.S. propane sales, while the remaining 40 other states and District of Columbia totaled 53.5% of total sales. The table below shows the top 10 ranked states by total retail propane sales and average gallons sold per account.

Top 10 States by Total 2017 Retail Propane Sales (Millions of Gallons)

State	Rank	Total Retail Propane Sales	Share of U.S. Propane Sales (%)	Residential Sales per Account	Commercial Sales per Account	Other Sectors Sales per Account	All Sectors Sales per Account
California	1	492	6.0%	325	1,956	2,183	646
Michigan	2	489	6.0%	581	1,712	2,126	704
Minnesota	3	444	5.4%	753	2,453	2,203	1,053
New York	4	355	4.3%	279	1,601	1,441	398
Iowa	5	353	4.3%	668	2,190	3,093	1,178
Wisconsin	6	346	4.2%	682	2,215	1,503	839
Texas	7	342	4.2%	257	1,442	1,980	498
North Carolina	8	337	4.1%	199	1,588	2,559	419
Pennsylvania	9	331	4.0%	321	1,461	1,584	497
Illinois	10	329	4.0%	727	2,558	1,811	997
Other States		4,386	53.5%	325	1,812	2,067	544
Total U.S.		8,205		362	1,795	2,080	585

- **California** was the top ranked state by total sales in 2017, and was the top ranked state in the commercial, cylinder, and internal combustion sectors and was ranked fifth for residential sales, which totaled 203 million gallons.
- **Michigan** was the second ranked state by total sales in 2017, and was the top ranked state for the residential sector, which totaled 367 million gallons.
- **Minnesota** was the third ranked state by total sales in 2017, and was ranked second in the residential and agriculture sectors, which totaled 255 and 102 million gallons.
- **New York** was the fourth ranked state by total sales in 2017, and was ranked fourth and third in the residential and commercial sectors, which totaled 225 and 56 million gallons.
- **Iowa** was the fifth ranked state by total sales in 2017, and had the highest level of agriculture sector sales, which totaled 162 million gallons.

2017 U.S. Retail Propane Sales by End-Use Sector

In 2017, there were 12 million total residential accounts across the U.S, which include 5.6 million households that use propane for primary space heating. There are nearly 2 million retail propane accounts in the other sectors. The table below shows total U.S. retail sales, the number of retail accounts, and average gallons sold per account.

Summary Information of Total U.S. 2017 Retail Propane Sales by End-Use Sectors

Category	Residential	Commercial	Agriculture	Industrial (Non-forklift)	Cylinder Markets	Internal Combustion	Total Sales
Gallons Sold	4,364,783,699	1,702,227,338	874,025,345	406,976,402	344,792,244	512,381,335	8,205,186,363
Total Accounts	12,053,567	948,267	333,419	176,701	334,590	183,476	14,030,020
Gallons per Account	362	1,795	2,621	2,303	1,030	2,793	585

- The **Residential** sector accounted for 53.2% of total sales, or 4,365 million gallons. The sector averaged sales of 362 gallons per account.
- The **Commercial** sector accounted for 20.7% of total sales, or 1,702 million gallons. The sector averaged sales of 1,795 gallons per account.
- The **Agriculture** sector accounted for 10.7% of total sales, or 874 million gallons. The sector averaged sales of 2,621 gallons per account.
- The **Industrial (Non-forklift)** sector accounted for 5% of total sales, or 407 million gallons. The sector averaged sales of 2,303 gallons per account.
- The **Cylinder Markets** sector accounted for 4.2% of total sales, or 345 million gallons. The sector averaged sales of 1,030 gallons per account.
- The **Internal Combustion** sector accounted for 6.2% of total sales, or 512 million gallons. The sector averaged sales of 2,793 gallons per account.



2017 Retail Propane Sales Report

The Annual Retail Propane Sales Report is a joint initiative between ICF and the Propane Education & Research Council (PERC). The 2017 Retail Propane Sales Report is undertaken to determine the odorized propane sales to end-use sectors for the calendar year 2017 and remains the only source of state-level end-use sector sales information for odorized propane.

Reason for the Retail Propane Sales Report:

Information for state level and end-use odorized propane sales is required by PERC in order to fulfill specific requirements of the 1996 Propane Education and Research Act (PERA). Under the PERA Act, 20 percent of assessment collections are eligible for rebate back to the states. The allocation of the rebate between the states is determined by the percentage of the total odorized propane sales in each state. PERA also places limits on the share of total PERC investment in the on-road market to no more than the share of the total propane market used for motor vehicle combustion, and sets a minimum of five percent of total assessments that must be allocated to the agricultural sector. This report is the only available source of retail propane sales by state and end-use sector.

The allocation of odorized propane sales between the states has a significant impact on the PERC allocation of expenditures. Each state's allocation of rebate funds is based on the latest retail sales data for residential, commercial, industrial, internal-combustion engine fuel, agricultural uses, and sales to retail dispensers that are compiled using the responses to this report. As a result, the reporting of sales volumes from propane retailers is a critical component of the PERC budgeting process.

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State level total and end-use sector sales information has been published only where sales and account information was provided by three or more participant respondents. For state level end-use sector information without three or more respondents, sector and state information has not been provided. Areas where this information has been withheld intentionally have been marked with a "**".

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National Retail Propane Sales

2017 U.S. Retail Propane Sales Summary by Sector (Millions of Gallons)

	Residential	Commercial	Agriculture	Industrial (Non-forklift)	Cylinder Markets	Internal Combustion	Total Sales
United States	4,365	1,702	874	407	345	512	8,205

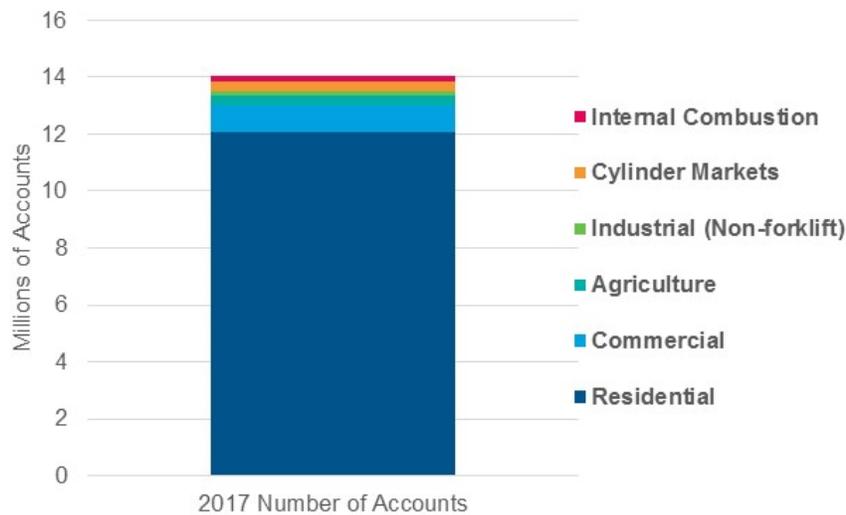
2017 U.S. Retail Propane Accounts by Sector (Number of Accounts)

	Residential	Commercial	Agriculture	Industrial (Non-forklift)	Cylinder Markets	Internal Combustion	Total
United States	12,053,567	948,267	333,419	176,701	334,590	183,476	14,030,020

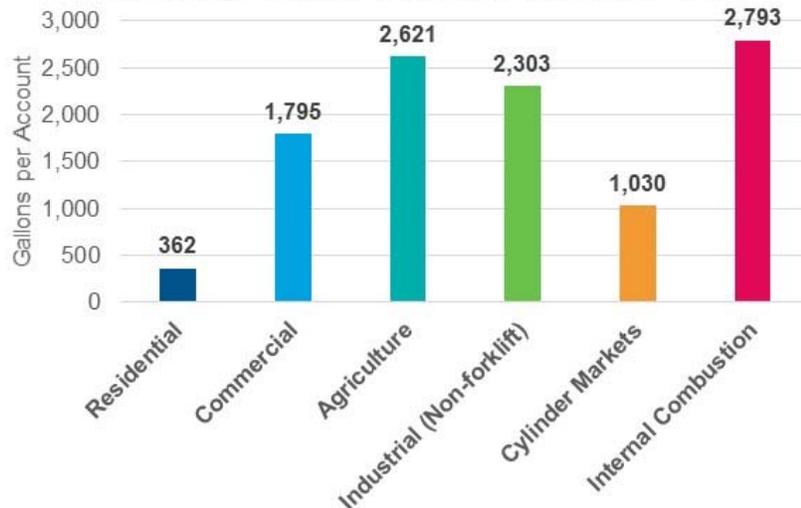
2017 U.S. Retail Propane Sales per Accounts by Sector (Gallons per Accounts)

	Residential	Commercial	Agriculture	Industrial (Non-forklift)	Cylinder Markets	Internal Combustion	Total
United States	362	1,795	2,621	2,303	1,030	2,793	585

2017 Total U.S. Retail Propane Accounts by Sector



2017 Average U.S. Retail Propane Sales per Account



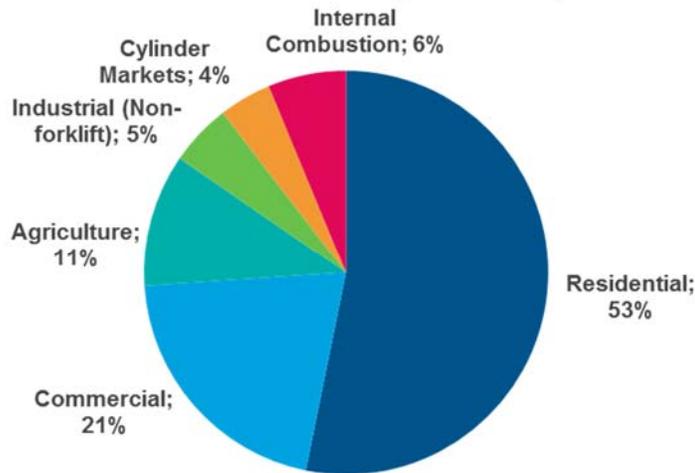
2017 U.S. Retail Propane Sales by Census Division and Sector (Millions of Gallons)

Census Division	Residential	Commercial	Agriculture	Industrial (Non-forklift)	Cylinder Markets	Internal Combustion	Total
East North Central	1,084	197	170	39	44	120	1,655
East South Central	191	80	36	14	22	33	377
Middle Atlantic	447	176	29	33	32	43	762
Mountain	384	140	13	54	31	29	651
New England	430	196	2	33	18	13	692
Pacific	315	245	66	60	58	71	816
South Atlantic	507	376	135	76	61	93	1,247
West North Central	745	178	378	51	38	37	1,428
West South Central	261	114	44	45	41	72	578
U.S. Total	4,365	1,702	874	407	345	512	8,205

2017 U.S. Retail Propane Sales by PADD and Sector (Millions of Gallons)

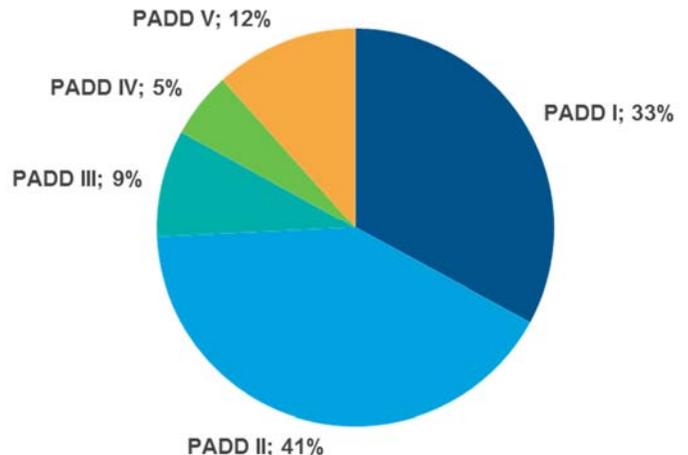
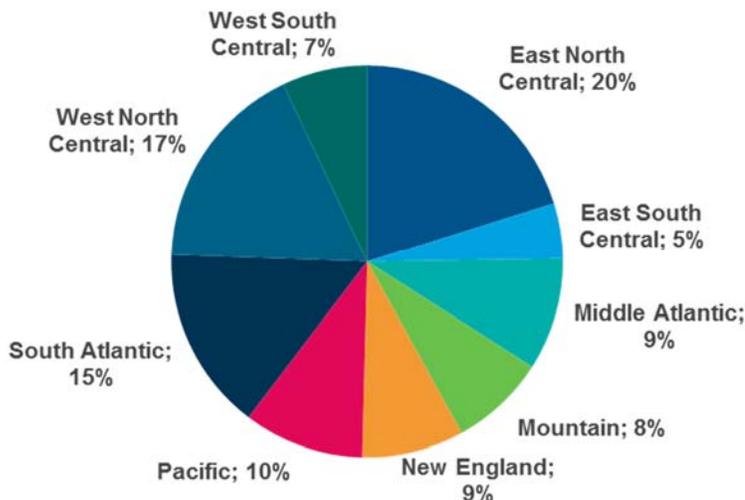
PADD District	Residential	Commercial	Agriculture	Industrial (Non-forklift)	Cylinder Markets	Internal Combustion	Total
PADD I	1,384	748	166	142	111	149	2,700
PADD II	1,990	431	561	107	106	194	3,390
PADD III	333	151	69	53	41	71	718
PADD IV	288	87	8	26	16	14	439
PADD V	370	285	70	79	71	84	958
U.S. Total	4,365	1,702	874	407	345	512	8,205

Share of 2017 Total U.S. Retail Propane Sales by Sector



Share of 2017 Total Retail Propane Sales by Census Division

Share of 2017 Total Retail Propane Sales by PADD District



State Rankings by Retail Propane Sales Metrics

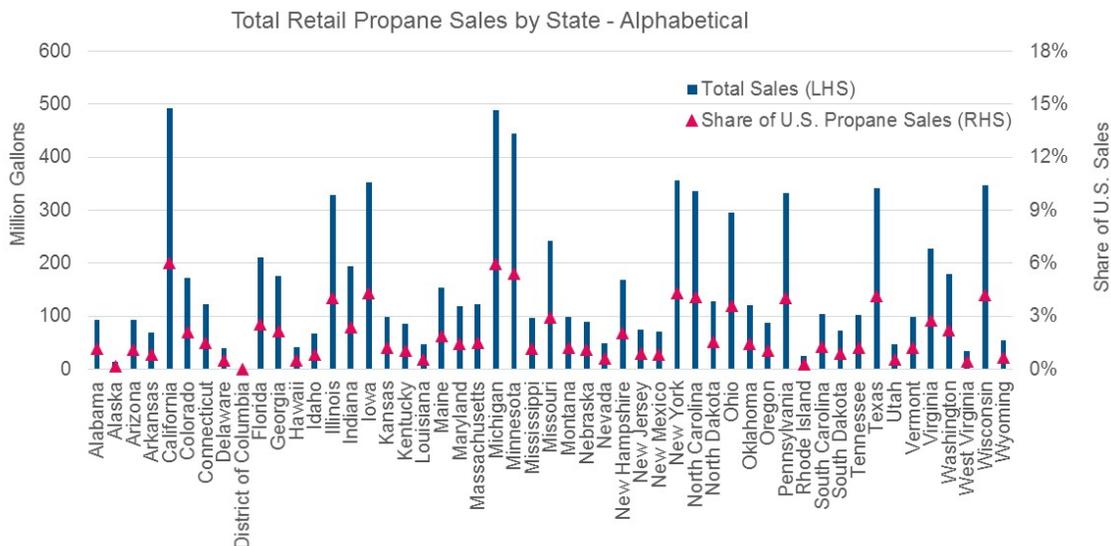
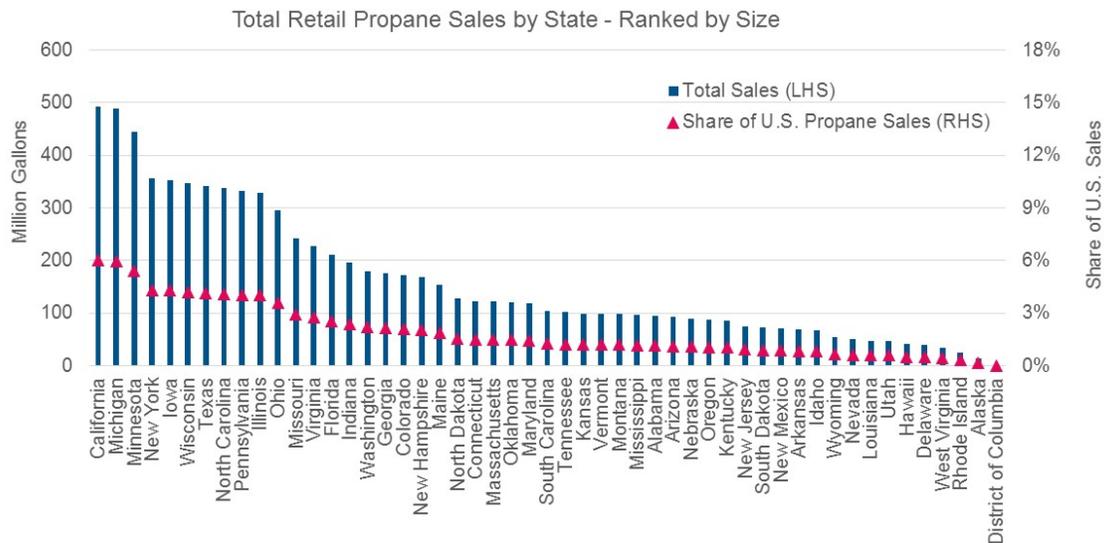
2017 Total Propane Sales: Top 10 States Shown by Millions of Gallons Sold

State	Rank	Total Retail Propane Sales	Share of U.S. Propane Sales (%)
California	1	492	6.0%
Michigan	2	489	6.0%
Minnesota	3	444	5.4%
New York	4	355	4.3%
Iowa	5	353	4.3%
Wisconsin	6	346	4.2%
Texas	7	342	4.2%
North Carolina	8	337	4.1%
Pennsylvania	9	331	4.0%
Illinois	10	329	4.0%
Other States		4,386	53.5%
Total U.S.		8,205	

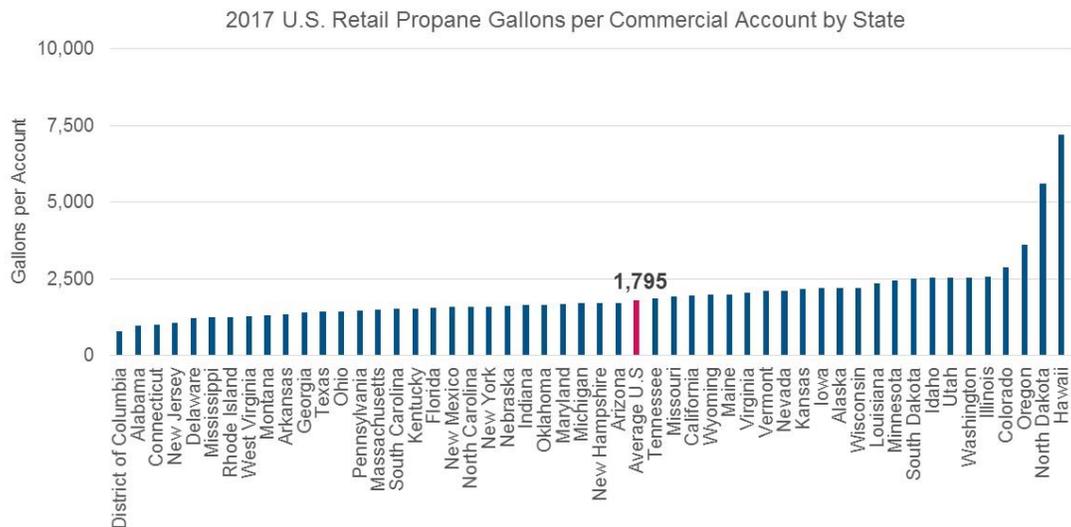
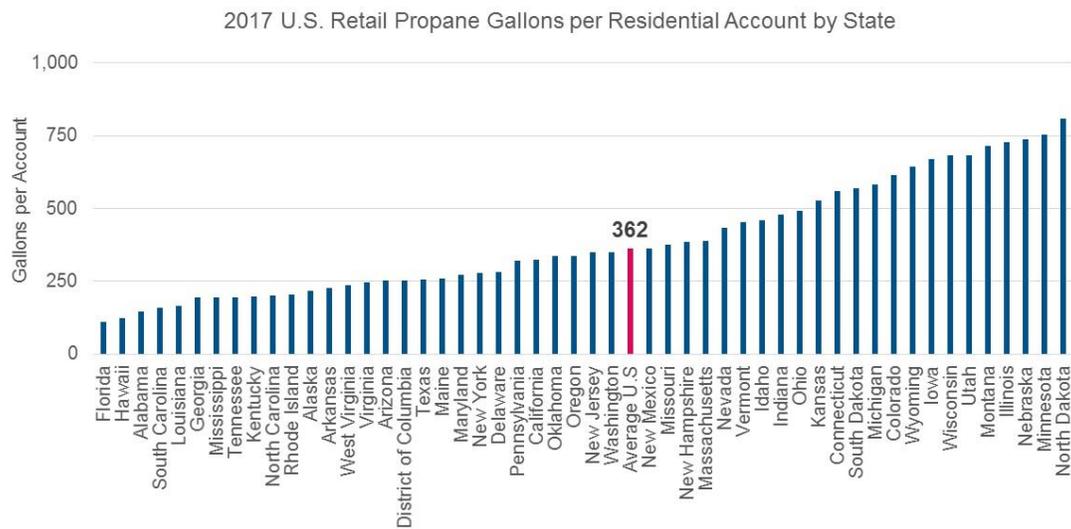
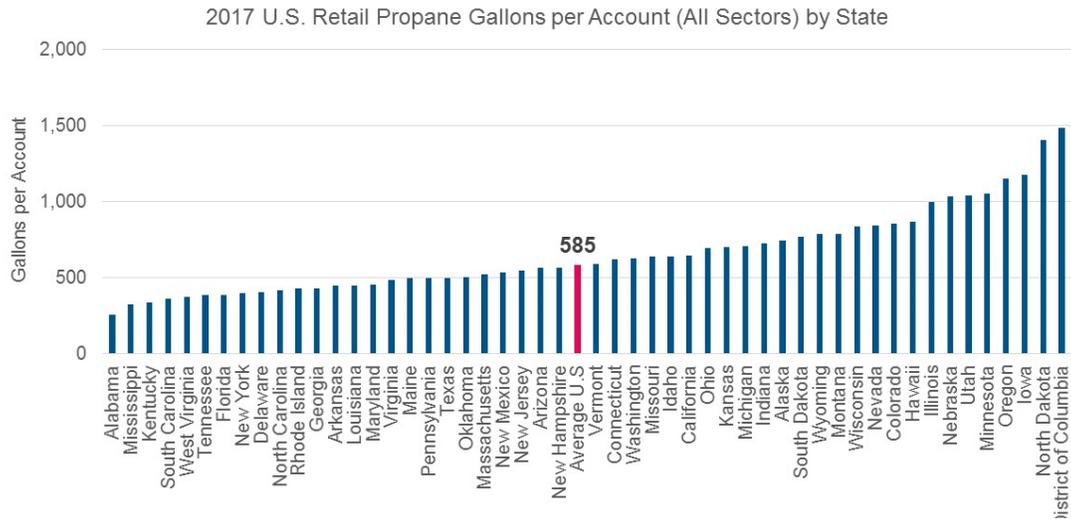
2017 Residential and Commercial Propane Sales: Top 10 States Shown by Millions of Gallons Sold

State	Rank	Total Residential and Commercial Propane Sales	Share of U.S. Propane Sales (%)
Michigan	1	412	9.44%
California	2	323	7.40%
Minnesota	3	310	7.11%
New York	4	310	7.10%
Wisconsin	5	282	6.45%
Pennsylvania	6	261	5.99%
Illinois	7	232	5.31%
North Carolina	8	230	5.28%
Ohio	9	221	5.05%
Texas	10	220	5.03%
Other States		1,565	35.85%
Total U.S.		4,365	

2017 State Rankings: Retail Propane Sales (Millions of Gallons)



2017 State Rankings: Retail Propane Sales per Account (Gallons per Account)



Detailed State Level Information

2017 U.S. Retail Propane Sales Summary by State and Sector (Millions of Gallons)

State	Residential	Commercial	Agriculture	Industrial (Non-forklift)	Cylinder Markets	Internal Combustion	Total
Alabama	48	22	10	4	4	6	94
Alaska ¹	3	7	*	*	*	*	14
Arizona	34	27	3	11	9	8	93
Arkansas	30	9	21	2	2	4	69
California	203	120	53	25	39	52	492
Colorado	106	35	2	14	7	8	173
Connecticut	96	19	0	2	2	4	123
Delaware	24	8	4	1	1	1	39
District of Columbia ¹	0	0	*	*	*	*	0
Florida	50	83	7	29	18	23	210
Georgia	69	38	32	8	8	22	175
Hawaii ¹	5	33	*	*	*	*	42
Idaho	43	14	2	3	3	2	66
Illinois	188	43	47	11	10	29	329
Indiana	111	24	32	5	6	17	195
Iowa	155	23	162	1	4	6	353
Kansas	64	13	8	7	3	5	99
Kentucky	45	16	6	4	3	10	85
Louisiana	15	15	7	3	4	4	48
Maine	69	77	0	4	2	1	154
Maryland	63	34	8	4	6	5	119
Massachusetts	82	24	1	3	7	6	122
Michigan	367	45	26	6	14	30	489
Minnesota	255	56	102	6	18	8	444
Mississippi	51	20	18	2	2	4	96
Missouri	125	43	45	8	8	14	242
Montana	78	15	1	3	1	0	98
Nebraska	48	5	31	2	2	2	90
Nevada	21	13	1	8	3	5	50
New Hampshire	103	48	0	14	2	1	168
New Jersey	40	12	1	4	7	10	75
New Mexico	41	13	1	9	3	2	70
New York	225	85	9	9	14	13	355
North Carolina	141	89	64	14	15	14	337
North Dakota	55	26	17	26	2	1	127
Ohio	179	42	37	6	9	23	295
Oklahoma	68	19	4	7	8	13	120
Oregon	18	38	5	12	7	9	88
Pennsylvania	182	79	19	20	11	20	331
Rhode Island	11	4	0	6	3	2	25
South Carolina	40	33	11	6	5	10	104
South Dakota	43	12	15	1	2	1	73
Tennessee	47	21	3	5	13	13	101
Texas	148	72	12	33	27	50	342
Utah	24	11	2	4	3	4	48
Vermont	69	23	0	5	1	0	99
Virginia	100	83	9	11	8	16	227
Washington	87	47	7	20	9	9	180
West Virginia	20	8	1	3	2	2	35
Wisconsin	239	43	28	11	5	21	346
Wyoming	37	12	1	2	1	0	54
U.S. Total	4,365	1,702	874	407	345	512	8,205

¹ Information labeled as "*" has been not disclosed per ICF and PERC's confidentiality guidelines for the Retail Propane Sale Report

2017 U.S. Retail Propane Accounts by State and Sector (Number of Accounts)

State	Residential	Commercial	Agriculture	Industrial (Non-forklift)	Cylinder Markets	Internal Combustion	Total
Alabama	327,813	22,486	4,806	3,701	4,622	2,767	366,195
Alaska ¹	13,418	3,381	*	*	*	*	18,219
Arizona	134,034	15,724	978	2,832	7,664	3,342	164,575
Arkansas	132,506	6,586	7,917	1,227	2,997	2,237	153,469
California	622,724	61,479	28,426	12,333	16,005	20,817	761,784
Colorado	171,763	12,137	2,774	3,369	8,746	3,568	202,357
Connecticut	171,317	19,150	342	1,149	4,561	1,466	197,986
Delaware	85,928	6,651	1,967	1,642	407	226	96,822
District of Columbia ¹	11	9	*	*	*	*	95
Florida	452,519	53,415	2,808	14,200	10,923	11,698	545,563
Georgia	355,352	26,525	6,093	4,276	7,840	5,761	405,846
Hawaii ¹	42,693	4,594	*	*	*	*	48,274
Idaho	94,222	5,537	547	1,576	1,369	850	104,101
Illinois	259,303	16,899	19,931	4,291	18,673	10,787	329,884
Indiana	232,585	14,389	6,266	4,445	6,932	4,579	269,197
Iowa	232,523	10,709	46,629	1,153	6,049	2,423	299,486
Kansas	121,965	5,996	2,350	1,051	8,376	2,394	142,132
Kentucky	229,709	10,675	5,546	2,257	2,994	3,612	254,793
Louisiana	88,640	6,192	3,933	908	4,670	2,191	106,534
Maine	268,816	38,813	206	605	2,942	446	311,827
Maryland	230,853	20,026	4,245	2,777	2,816	2,101	262,820
Massachusetts	211,149	15,641	776	1,554	2,335	2,786	234,241
Michigan	632,148	26,257	9,776	4,750	12,867	8,879	694,676
Minnesota	338,198	22,706	33,932	5,323	18,111	3,383	421,654
Mississippi	258,900	16,010	12,079	2,337	3,012	1,270	293,608
Missouri	331,417	22,099	10,038	4,332	6,593	4,476	378,954
Montana	108,696	11,531	749	1,258	1,739	462	124,436
Nebraska	65,605	3,086	10,924	248	6,037	503	86,403
Nevada	48,080	6,012	393	1,593	1,444	1,683	59,205
New Hampshire	265,791	27,915	49	1,671	1,517	651	297,594
New Jersey	115,031	11,483	788	2,755	1,625	5,285	136,968
New Mexico	113,993	8,382	462	2,819	4,667	878	131,200
New York	807,243	53,081	12,339	6,522	4,711	7,934	891,831
North Carolina	706,132	56,344	14,806	7,291	13,920	5,581	804,074
North Dakota	67,792	4,703	3,191	3,076	11,209	591	90,562
Ohio	362,420	28,945	13,931	4,935	6,603	7,541	424,374
Oklahoma	204,123	11,472	4,023	6,238	11,097	2,915	239,867
Oregon	52,623	10,435	1,743	6,195	2,719	2,912	76,629
Pennsylvania	568,863	54,055	10,532	8,859	18,437	6,411	667,156
Rhode Island	52,158	3,528	61	1,469	514	475	58,204
South Carolina	251,351	21,637	4,532	2,856	3,280	3,447	287,103
South Dakota	75,156	4,801	5,963	522	8,282	622	95,346
Tennessee	239,219	11,323	1,718	3,598	4,889	3,700	264,447
Texas	574,902	49,893	6,376	6,348	35,930	12,960	686,408
Utah	35,293	4,233	748	1,662	1,771	1,956	45,663
Vermont	153,237	10,881	492	1,480	932	225	167,248
Virginia	407,352	40,440	8,013	5,083	5,113	3,592	469,593
Washington	246,929	18,430	7,914	5,562	3,670	3,820	286,325
West Virginia	82,903	6,119	744	711	2,174	584	93,234
Wisconsin	350,235	19,358	9,887	8,816	18,783	5,610	412,689
Wyoming	57,934	6,096	653	2,173	1,074	438	68,369
U.S. Total	12,053,567	948,267	333,419	176,701	334,590	183,476	14,030,020

¹ Information labeled as "*" has been not disclosed per ICF and PERC's confidentiality guidelines for the Retail Propane Sale Report

2017 U.S. Retail Propane Sales per Accounts by State and Sector (Gallons per Accounts)

State	Residential	Commercial	Agriculture	Industrial (Non-forklift)	Cylinder Markets	Internal Combustion	Total
Alabama	147	991	2,089	965	845	2,180	257
Alaska ¹	218	2,202	*	*	*	*	744
Arizona	252	1,725	3,337	3,878	1,213	2,444	562
Arkansas	228	1,354	2,629	1,813	668	1,926	446
California	325	1,956	1,880	2,016	2,441	2,498	646
Colorado	615	2,887	759	4,271	857	2,225	853
Connecticut	561	1,002	446	1,475	530	2,554	622
Delaware	283	1,222	1,929	607	1,937	5,598	406
District of Columbia ¹	252	785	*	*	*	*	1,486
Florida	111	1,555	2,426	2,044	1,653	1,982	386
Georgia	193	1,420	5,171	1,792	996	3,761	431
Hawaii ¹	124	7,200	*	*	*	*	866
Idaho	458	2,528	3,263	1,926	2,005	2,003	638
Illinois	727	2,558	2,373	2,528	521	2,723	997
Indiana	479	1,642	5,060	1,129	909	3,731	725
Iowa	668	2,190	3,478	1,187	669	2,640	1,178
Kansas	527	2,167	3,200	6,228	307	2,226	698
Kentucky	198	1,536	1,101	1,861	1,149	2,664	335
Louisiana	167	2,350	1,760	3,455	810	2,024	447
Maine	258	1,995	1,423	6,320	845	2,396	495
Maryland	273	1,681	1,783	1,550	1,990	2,532	455
Massachusetts	387	1,511	1,425	1,856	3,089	2,065	522
Michigan	581	1,712	2,671	1,334	1,108	3,426	704
Minnesota	753	2,453	3,006	1,094	1,014	2,252	1,053
Mississippi	195	1,253	1,461	821	692	2,914	327
Missouri	377	1,938	4,436	1,930	1,141	3,049	638
Montana	715	1,308	842	2,226	824	1,069	789
Nebraska	737	1,625	2,798	8,519	267	3,708	1,036
Nevada	435	2,125	1,666	4,829	2,172	2,734	841
New Hampshire	386	1,724	1,018	8,523	1,624	1,559	566
New Jersey	349	1,058	1,824	1,355	4,246	1,986	547
New Mexico	364	1,577	3,140	3,341	540	2,727	537
New York	279	1,601	695	1,383	3,057	1,691	398
North Carolina	199	1,588	4,315	1,915	1,059	2,483	419
North Dakota	809	5,599	5,185	8,586	175	2,025	1,405
Ohio	493	1,447	2,623	1,253	1,394	3,007	696
Oklahoma	335	1,647	1,031	1,167	715	4,620	501
Oregon	336	3,600	3,066	1,979	2,421	2,981	1,150
Pennsylvania	321	1,461	1,844	2,289	587	3,052	497
Rhode Island	204	1,256	1,281	3,882	5,148	3,225	430
South Carolina	158	1,523	2,366	2,069	1,421	2,778	361
South Dakota	568	2,497	2,517	1,416	190	2,234	770
Tennessee	196	1,881	1,522	1,330	2,572	3,567	383
Texas	257	1,442	1,924	5,134	747	3,879	498
Utah	683	2,550	2,955	2,238	1,757	1,851	1,041
Vermont	452	2,115	456	3,262	1,041	1,167	590
Virginia	246	2,046	1,183	2,245	1,488	4,443	484
Washington	351	2,550	945	3,681	2,575	2,352	629
West Virginia	237	1,297	1,420	3,530	811	2,984	372
Wisconsin	682	2,215	2,834	1,259	257	3,710	839
Wyoming	644	1,979	1,224	1,070	943	902	789
U.S. Total	362	1,795	2,621	2,303	1,030	2,793	585

¹ Information labeled as "*" has been not disclosed per ICF and PERC's confidentiality guidelines for the Retail Propane Sale Report

Total Households using Propane for Primary Space Heating Fuel by State: 2013 to 2017

State	2013	2014	2015	2016	2017	Five Year Average (2013 to 2017)	Percent Change from 2016 to 2017	Percent Change from Five Year Average to 2017
Alabama	121,771	113,869	114,106	110,784	106,561	113,418	-3.8%	-6.0%
Alaska	3,471	2,843	3,713	3,726	4,456	3,642	19.6%	22.4%
Arizona	66,318	65,065	65,811	68,204	69,551	66,990	2.0%	3.8%
Arkansas	79,497	81,113	76,481	75,539	75,397	77,605	-0.2%	-2.8%
California	376,616	406,961	399,275	411,060	420,817	402,946	2.4%	4.4%
Colorado	95,660	95,838	97,415	98,087	98,538	97,108	0.5%	1.5%
Connecticut	46,397	49,540	51,915	55,631	55,608	51,818	0.0%	7.3%
Delaware	32,922	35,973	36,295	37,262	33,703	35,231	-9.6%	-4.3%
District of Columbia	2,849	2,802	3,343	2,508	2,821	2,865	12.5%	-1.5%
Florida	74,420	72,578	71,936	67,492	62,817	69,849	-6.9%	-10.1%
Georgia	185,887	176,341	170,705	169,822	170,519	174,655	0.4%	-2.4%
Hawaii	5,536	4,314	4,349	5,212	6,467	5,176	0.0%	25.0%
Idaho	30,365	27,837	27,508	29,878	32,187	29,555	7.7%	8.9%
Illinois	194,278	198,181	191,916	198,339	195,290	195,601	-1.5%	-0.2%
Indiana	176,348	181,828	177,999	177,100	179,223	178,500	1.2%	0.4%
Iowa	163,459	163,627	162,877	161,914	161,999	162,775	0.1%	-0.5%
Kansas	83,386	88,639	86,149	82,676	79,341	84,038	-4.0%	-5.6%
Kentucky	108,051	106,636	104,751	105,573	100,860	105,174	-4.5%	-4.1%
Louisiana	37,860	38,279	37,623	36,189	35,678	37,126	-1.4%	-3.9%
Maine	45,601	48,027	50,511	52,621	61,816	51,715	17.5%	19.5%
Maryland	67,436	71,602	72,692	74,399	75,324	72,291	1.2%	4.2%
Massachusetts	81,306	77,135	79,528	81,858	88,756	81,717	8.4%	8.6%
Michigan	319,698	314,434	314,724	318,742	321,684	317,856	0.9%	1.2%
Minnesota	216,973	223,105	225,549	217,584	221,643	220,971	1.9%	0.3%
Mississippi	128,930	129,561	130,201	114,510	122,558	125,152	7.0%	-2.1%
Missouri	218,963	219,176	211,223	202,010	202,547	210,784	0.3%	-3.9%
Montana	49,009	50,495	49,552	47,891	52,646	49,919	9.9%	5.5%
Nebraska	57,576	56,850	58,229	50,453	50,971	54,816	1.0%	-7.0%
Nevada	27,742	27,175	25,153	28,287	27,839	27,239	-1.6%	2.2%
New Hampshire	76,485	76,212	78,670	81,949	90,341	80,731	10.2%	11.9%
New Jersey	60,943	62,396	61,082	59,916	62,490	61,365	4.3%	1.8%
New Mexico	61,554	59,610	60,267	54,610	51,066	57,421	-6.5%	-11.1%
New York	259,367	258,775	265,224	273,838	294,973	270,435	7.7%	9.1%
North Carolina	280,693	279,111	271,792	275,766	267,466	274,966	-3.0%	-2.7%
North Dakota	39,927	39,684	41,709	40,651	43,794	41,153	7.7%	6.4%
Ohio	236,293	228,782	244,024	240,410	240,591	238,020	0.1%	1.1%
Oklahoma	103,324	97,810	95,737	95,067	93,322	97,052	-1.8%	-3.8%
Oregon	26,827	25,335	26,882	27,363	27,026	26,687	-1.2%	1.3%
Pennsylvania	195,799	198,296	200,754	209,719	222,650	205,444	6.2%	8.4%
Rhode Island	10,035	11,457	11,955	10,488	12,165	11,220	16.0%	8.4%
South Carolina	80,318	72,957	75,921	70,890	65,032	73,024	-8.3%	-10.9%
South Dakota	52,307	53,817	53,053	50,018	51,864	52,212	3.7%	-0.7%
Tennessee	105,832	99,108	99,323	99,337	97,227	100,165	-2.1%	-2.9%
Texas	293,618	293,663	293,458	273,637	281,245	287,124	2.8%	-2.0%
Utah	20,447	21,692	19,320	17,949	19,585	19,799	9.1%	-1.1%
Vermont	38,339	38,116	40,280	42,621	43,339	40,539	1.7%	6.9%
Virginia	137,668	138,787	134,535	141,229	137,068	137,857	-2.9%	-0.6%
Washington	80,336	79,785	83,835	83,921	83,993	82,374	0.1%	2.0%
West Virginia	30,813	32,740	34,766	33,741	37,545	33,921	11.3%	10.7%
Wisconsin	253,657	254,773	259,440	257,731	266,776	258,475	3.5%	3.2%
Wyoming	23,452	22,193	22,692	20,581	21,945	22,173	6.6%	-1.0%
U.S. Total	5,566,359	5,574,923	5,576,248	5,546,783	5,629,120	5,578,687	1.5%	0.9%

Source: U.S. Census American Community Survey

Annual Heating Degree Days¹ (HDDs) by State: 2013 to 2017

State	2013	2014	2015	2016	2017	Five Year Average (2013 to 2017)	Percent Change from 2016 to 2017	Percent Change from Five Year Average to 2017
Alabama	2,731	2,957	2,300	2,229	2,044	2,452	-8.3%	-16.6%
Alaska	10,397	9,458	9,810	9,286	10,451	9,880	12.5%	5.8%
Arizona	3,317	2,811	2,997	1,570	1,452	2,429	-7.5%	-40.2%
Arkansas	3,713	3,889	3,211	2,904	2,710	3,285	-6.7%	-17.5%
California	2,231	1,664	1,917	1,989	2,081	1,976	4.6%	5.3%
Colorado	7,172	6,683	6,448	6,365	6,256	6,585	-1.7%	-5.0%
Connecticut	5,950	6,247	6,012	5,358	5,574	5,828	4.0%	-4.4%
Delaware	4,514	4,788	4,425	4,191	4,012	4,386	-4.3%	-8.5%
District of Columbia	3,870	3,993	3,656	3,594	3,286	3,680	-8.6%	-10.7%
Florida	468	629	378	485	396	471	-18.4%	-16.0%
Georgia	2,891	3,100	2,453	2,445	2,244	2,627	-8.2%	-14.6%
Hawaii	0	0	0	0	1	0	0.0%	400.0%
Idaho	6,982	6,156	5,873	6,124	6,880	6,403	12.3%	7.4%
Illinois	6,632	7,130	5,999	5,531	5,518	6,162	-0.2%	-10.5%
Indiana	6,020	6,545	5,595	5,178	5,079	5,683	-1.9%	-10.6%
Iowa	7,622	7,903	6,581	6,218	6,356	6,936	2.2%	-8.4%
Kansas	5,553	5,502	4,605	4,304	4,369	4,867	1.5%	-10.2%
Kentucky	4,689	4,938	4,219	3,996	3,701	4,309	-7.4%	-14.1%
Louisiana	1,871	2,091	1,529	1,413	1,270	1,635	-10.1%	-22.3%
Maine	7,902	8,094	8,147	7,311	7,593	7,809	3.9%	-2.8%
Maryland	4,769	5,048	4,601	4,335	4,092	4,569	-5.6%	-10.4%
Massachusetts	6,260	6,468	6,298	5,589	5,864	6,096	4.9%	-3.8%
Michigan	8,285	8,742	7,146	6,057	6,186	7,283	2.1%	-15.1%
Minnesota	9,162	9,399	7,743	7,426	7,918	8,330	6.6%	-4.9%
Mississippi	2,636	2,845	2,185	2,066	1,851	2,317	-10.4%	-20.1%
Missouri	5,572	5,773	4,772	4,454	4,368	4,988	-1.9%	-12.4%
Montana	7,759	7,757	6,972	7,044	7,793	7,465	10.6%	4.4%
Nebraska	6,820	6,761	5,845	5,579	5,794	6,160	3.9%	-5.9%
Nevada	3,580	2,831	3,024	2,939	2,908	3,056	-1.1%	-4.9%
New Hampshire	7,376	7,622	7,425	6,714	6,998	7,227	4.2%	-3.2%
New Jersey	5,363	5,665	5,282	4,901	4,917	5,226	0.3%	-5.9%
New Mexico	4,611	4,127	4,246	3,984	3,649	4,123	-8.4%	-11.5%
New York	5,853	6,196	5,797	5,271	5,300	5,683	0.6%	-6.7%
North Carolina	3,566	3,680	3,139	3,209	3,043	3,327	-5.2%	-8.5%
North Dakota	9,944	9,726	8,282	7,924	8,753	8,926	10.5%	-1.9%
Ohio	5,944	6,411	5,661	5,180	5,094	5,658	-1.7%	-10.0%
Oklahoma	4,124	4,113	3,458	3,103	3,016	3,563	-2.8%	-15.3%
Oregon	5,287	4,656	4,499	4,890	5,479	4,962	12.0%	10.4%
Pennsylvania	5,904	6,307	5,715	5,308	5,295	5,706	-0.2%	-7.2%
Rhode Island	5,939	6,108	5,903	5,242	5,559	5,750	6.0%	-3.3%
South Carolina	2,854	3,025	2,429	2,498	2,251	2,611	-9.9%	-13.8%
South Dakota	8,136	8,021	6,848	6,646	7,087	7,348	6.6%	-3.5%
Tennessee	4,193	4,421	3,721	3,591	3,362	3,858	-6.4%	-12.8%
Texas	3,110	3,116	2,663	1,490	1,346	2,345	-9.7%	-42.6%
Utah	6,649	5,324	5,457	5,697	5,972	5,820	4.8%	2.6%
Vermont	7,990	8,386	8,209	7,452	7,643	7,936	2.6%	-3.7%
Virginia	4,459	4,637	4,117	3,958	3,749	4,184	-5.3%	-10.4%
Washington	5,493	4,975	4,739	4,847	5,615	5,134	15.8%	9.4%
West Virginia	5,317	5,575	4,901	4,716	4,482	4,998	-5.0%	-10.3%
Wisconsin	9,162	9,399	7,743	6,855	7,070	8,046	3.1%	-12.1%
Wyoming	7,985	7,543	7,217	7,324	7,537	7,521	2.9%	0.2%
U.S. Average	4,496	4,578	4,111	3,875	3,881	4,188	0.2%	-7.3%

Source: National Oceanic and Atmospheric Administration - Population Weighted HDDs

¹ A Heating Degree Day (HDD) is the difference between 65 degrees Fahrenheit and the daily mean temperature at that location. It is primarily a measure used to estimate heating requirements.

Historical Propane Volumes

Ten-Year Trend of U.S. Propane Odorization and Consumption Volumes

Over the past ten years, sales to the domestic retail propane sector have declined modestly, fluctuating with changes in weather, relative fuel pricing, and general economic conditions. From 2008 to 2017, U.S. odorized propane volumes averaged 8.6 billion gallons per year.² While odorization volume assessments do not directly indicate sales, they do represent a reliable estimate that can be used as a proxy for annual retail propane sales volumes, which totaled 8,205,186,363 gallons in 2017.

From 2008 to 2017, residential propane consumption declined from 5.4 billion gallons in 2008 to 4.4 billion gallons in 2017 led by a 23% decline in residential space heating demand.³ Most of the decline in residential demand was the result of warmer weather in 2017. However, weather adjusted sales also declined due to a decline in space heating households from 2008 levels.

On a household and weather adjusted basis, residential consumption showed steady year-on-year declines, consistent with energy efficiency improvements, offset somewhat by higher penetration of propane water heating and other appliances such as cooking and clothes drying. Residential consumption per household with propane as a primary space heating fuel, from 918 gallons per household in 2008 to 775 gallons per household in 2017.

U.S. Propane Odorization⁴ & Consumption Volumes (Millions of Gallons)

Year	U.S. Odorization Volumes: Propane ⁴	Other Sectors: Total	Residential: Total	Residential: Space Heating	Residential: Water Heating	Residential: Other	U.S. Propane Heated Households	U.S. Average Heating Degree Days	Residential Gallons per Household
2008	9,323	3,909	5,414	3,659	1,053	702	5,895,495	4,510	918
2009	9,210	3,826	5,384	3,754	880	751	5,846,740	4,423	921
2010	8,754	3,666	5,088	3,513	863	712	5,779,069	4,445	880
2011	8,232	3,425	4,807	3,283	848	676	5,610,519	4,320	857
2012	7,482	3,069	4,414	2,976	814	623	5,542,387	3,792	796
2013	9,091	4,760	4,331	2,881	835	615	5,566,359	4,496	778
2014	9,313	5,159	4,155	2,722	839	593	5,674,923	4,578	745
2015	8,318	4,366	3,952	2,549	835	567	5,576,248	4,111	709
2016	8,191	4,063	4,128	2,662	872	592	5,546,783	3,875	744
2017	8,208	3,840	4,365	2,815	922	626	5,629,120	3,881	775

Sources: PERC, ICF, NOAA, EIA RECs, U.S. Census

² Odorized propane volumes are estimated based on PERC Assessment Collections.

³ The residential sector primary end-use consumption information was estimated by ICF using information from the EIA's Residential Energy Consumption Survey Data (2001, 2005, 2009, and 2015). The residential consumption information for 2016 and 2017 was extrapolated from the 2015 survey data and adjusted for local weather conditions.

⁴ PERC Assessment Collections represent the total assessments collected during the calendar year.

Ten-Year Trend of U.S. Propane Supply and Disposition

From 2008 to 2017, U.S. propane production experienced an unprecedented increase, rising from 15.8 billion gallons in 2008 to 28 billion gallons in 2017 (including minor volumes of propylene). This increase was almost entirely due to growth in natural gas and liquids production, with propane production from gas processing plants more than doubling to 18.9 billion gallons in 2017.

As a result, the U.S. propane sector has undergone a dramatic transformation from a primarily domestically focused market, to one focused more on growing exports. U.S. propane / propylene exports increased from 0.8 billion gallons in 2008 to over 14 billion gallons in 2017. Exports now represent over 50% of U.S. production and are significantly larger than odorized propane sales.

U.S. Propane / Propylene Supply and Disposition Volumes (Millions of Gallons)

Year	U.S. Production: Propane / Propylene	U.S. Gas Plant Production: Propane / Propylene	U.S. Net Refinery Production: Propane / Propylene	U.S. Imports: Propane / Propylene	U.S. Exports: Propane / Propylene	U.S. Changes in Stocks: Propane / Propylene	Net U.S. Supply: Propane / Propylene	U.S. Odorization Volumes: Propane
2008	15,849	7,868	7,981	2,845	809	143	17,742	9,323
2009	16,607	8,375	8,232	2,254	1,299	-221	17,784	9,210
2010	17,556	8,979	8,577	1,857	1,674	-38	17,777	8,754
2011	18,132	9,670	8,463	1,679	1,900	241	17,670	8,232
2012	19,447	10,950	8,497	1,783	2,625	547	18,059	7,482
2013	21,268	12,615	8,654	1,944	4,627	-962	19,548	9,091
2014	24,100	15,096	9,004	1,650	6,482	1,380	17,887	9,313
2015	26,111	17,541	8,571	1,896	9,426	769	17,813	8,318
2016	26,954	17,927	9,028	2,187	12,285	-511	17,368	8,191
2017	28,016	18,948	9,069	2,395	14,009	-725	17,127	8,208

Sources: EIA, PERC

Non-Odorized Propane Sales Information

Propane can be used in a variety of manners within the petrochemical and refining sectors. The below table shows 2017 non-odorized propane sales in the U.S. for the petrochemical sector only. Within the petrochemical sector, propane is used as a feedstock in steam cracking facilities and Propane DeHydrogenation (PDH) facilities. In 2017, sales to the petrochemical sector totaled 4,977,708,000 gallons of propane, roughly 60% of total U.S. retail propane sales for the year.

U.S. Chemical Sector Non-Odorized Sales Volumes (Millions of Gallons)

Year	Ethylene Feedstock (Steam Cracking)	PDH Feedstock	Total Chemical Sales
Texas	3,438	527	3,965
Louisiana	973	0	973
Iowa	39	0	39
Illinois	0	0	0
U.S. Total	4,450	527	4,977

Source: Petral Consulting

In recent years there have been several new PDH facilities built in the U.S. to take advantage of growing U.S. propane supply. These facilities use propane to create propylene, a primary product used in plastics manufacturing.

Review of Annual Retail Propane Sales Report Methodology

End-Use Sector Definitions

Residential Sector:

Residential propane sales include odorized propane delivered to and used by residential consumers at their place of residence for fixed applications. Uses include space heating, water heating, cooking, spa/pool use, and other household uses. Residential sector sales include delivery and replacement of 100-pound cylinders attached at fixed locations. Residential sales do not include household use of propane from 20-pound (or similar) cylinders used for portable appliances and applications.

Commercial Sector:

Commercial sector propane sales include odorized propane delivered to and used by commercial entities, such as schools, hospitals, retail outlets, office buildings, and other types of non-industrial outlets. Commercial sales do not include propane used forklifts or engine use. Commercial sales does include propane used in on-site standby or backup electric generation at the facility.

Industrial (Non-Forklift) Sector:

Industrial (non-forklift) sector propane sales include odorized propane delivered to and used by industrial or manufacturing facilities for process heating, large scale combined heat and power systems, distributed generation, or as a fuel for furnaces. Propane used by industrial customers in forklifts or other internal combustion engines is reported as Internal Combustion and is not included in industrial (non-forklift) sector.

Agricultural Sector:

Agricultural sector propane sales include odorized propane delivered to and used by agricultural entities that are primarily engaged in growing crops, raising animals, or other agricultural products. Agricultural sector sales include propane used for grain drying, agricultural harvesting activities, weed control, radiant heating systems, crop irrigation engines, and other related agricultural applications. Propane used by agricultural customers in other internal combustion engine applications is reported in the Internal Combustion category.

Cylinder Markets:

Propane that is delivered and used in a 20-pound (or similar) cylinder. The definition of propane cylinder markets does not include wholesale or bulk propane sales to other propane retailers, fixed 100-pound (or similar) cylinders attached at fixed residential locations, or cylinders used by forklifts, commercial mowers, or other internal combustion engines. Information on cylinder market sales volumes were reported by participating companies using the following two sub-categories:

- **Consumer Bottle Refill & Exchange:** Residential, or individual use bottle exchange programs. Includes bottle filling programs at grocery stores, gas stations, campgrounds, and other individual-use sites.
- **Rental Yards / RV Refill Stations / Other:** Direct sales to large direct consumer cylinder program managers. Does not include propane sales for use in public autogas fueling infrastructure to companies such as Pilot, Menards, and U-Haul, which should be reported in the autogas section.

These two sub-categories have been added together for the total cylinder market sales.

Internal Combustion:

The Internal Combustion sector includes odorized propane sales for use in internal combustion engines (other than agricultural irrigation engines). Information on internal combustion sales volumes were reported by participating companies for the following three sub-categories:

- **Propane Autogas:** All other odorized propane use by Internal Combustion engines for On-road vehicles. Can either be consumed from cylinders or directly.
- **Material Handling (Forklifts):** Only includes odorized propane use by forklifts at commercial and industrial sites, as well as airport and port equipment. Can either be consumed in cylinders or directly.
- **Non-Road:** Only includes propane used by commercial mower, outdoor power equipment, golf equipment, ATVs, or other non-road vehicles. Can either be consumed in cylinders or directly.

These three sub-categories have been added together for the total internal combustion sales.

Overview of Report Approach

The 2017 Retail Propane Sales Report was conducted during 2018 and included several distinct stages, detailed below:

- **Pre-Launch:** The pre-launch phase began in February 2018 and the end of April 2018. Working with PERC, ICF developed the participant reporting forms, website, and other outreach material. During this phase, ICF and PERC also worked with each designated state executive to review and verify the list of propane retailers within each state and their contact information.
- **Data Collection:** The data collection and outreach phase began in May 2018 and was extended through July 2018. This phase included the collection of company retail propane sales volumes through a survey-based approach.
- **Verification and Data Checking:** ICF conducted ongoing review of submitted information and performed data verification checks and reviews of the sales and company information throughout the data collection phase. During this phase ICF reached out directly to participants where there were any concerns or questions related to the information provided.
- **Reporting:** Following the collection and verification of the submitted information, ICF then developed its estimates for state level sales to each end-use category. The methodology for this process is detailed on the following pages. ICF then worked with PERC to review the initial report results. These results were then communicated to each designated state executive for them to provide feedback and review. Following these review steps, the report totals were then finalized.

Outreach and Data Collection

Data Sources

The primary source of information used in the creation of 2017 Retail Propane Sales Report has been provided directly by the participating Retail Propane companies and PERC. All sales and customer account information provided by participants is reflective of Calendar Year 2017 totals.

Additional data sources are also used throughout the report process in order to ensure the highest degree of accuracy and reporting. These additional data sources include, but are not limited to the following:

- United States Census: American Community Survey, American Housing Survey, Manufactured Household Survey, Survey of New Construction

- Energy Information Agency (EIA): Residential Energy Consumption Survey, Commercial Buildings Energy Consumption, Manufacturing Energy Consumption Survey, State Energy Data Systems
- Industry Trade Press and Publications
- National Oceanic and Atmospheric Administration: Climate Prediction Center
- Various State Reported Information

Annual Retail Propane Sales Report Participants

All active propane retailers that sell odorized, or retail, propane to end-use customers are requested to report propane sales as part of the Annual Retail Propane Sales Report. Each company can elect to report sales for each subsidiary or operating company separately or report the parent company total sales for each state.

The list of companies active within each state is developed in collaboration between ICF, PERC, and each state propane agency. These participant lists are used in the communication with each company during the participant reporting period and are updated each year to reflect changes in contact information and corporate structure, such as mergers and acquisitions, office closures, and expansion to new states.

Annual Retail Propane Sales Report Outreach

As the contractor for the 2017 Annual Retail Sales Report, ICF conducted the primary outreach to report participants and relevant stakeholders. The 2017 Annual Retail Sales Report was the first year that a website and an online outreach strategy were used. ICF primarily communicated with report participants via email and communication through the website. To ensure a high response rate and broad outreach to all Retail Propane companies, ICF also communicated to participant companies through direct mailings and phone calls. Each participating company was provided online account credentials to log into the website through the direct mailings, phone call outreach, or email. The Annual Retail Sales Report website can be located at www.propanesalessurvey.com. Please contact Survey@propane.com for any additional details on the website.

State Level Response Rates

There are over 3,000 active propane retailers in the United States. These retailers vary significantly by their regional composition, size, customer type, and sales focus areas. ICF categorized each company that was included in the Annual Retail Sales Report participants company into several different company types, the states that each company was active in, and the reported size of the company based on retail sales, reported number of employees, and number of accounts.

To help in the categorization of company types, ICF included in the participant reporting form on the website an option for a company categorization designation. Where a company provided this information, that designation was used. When this information was not provided, ICF categorized each company based on available public information and ICF's detailed knowledge of the retail propane markets.

ICF used the following four company type categories:

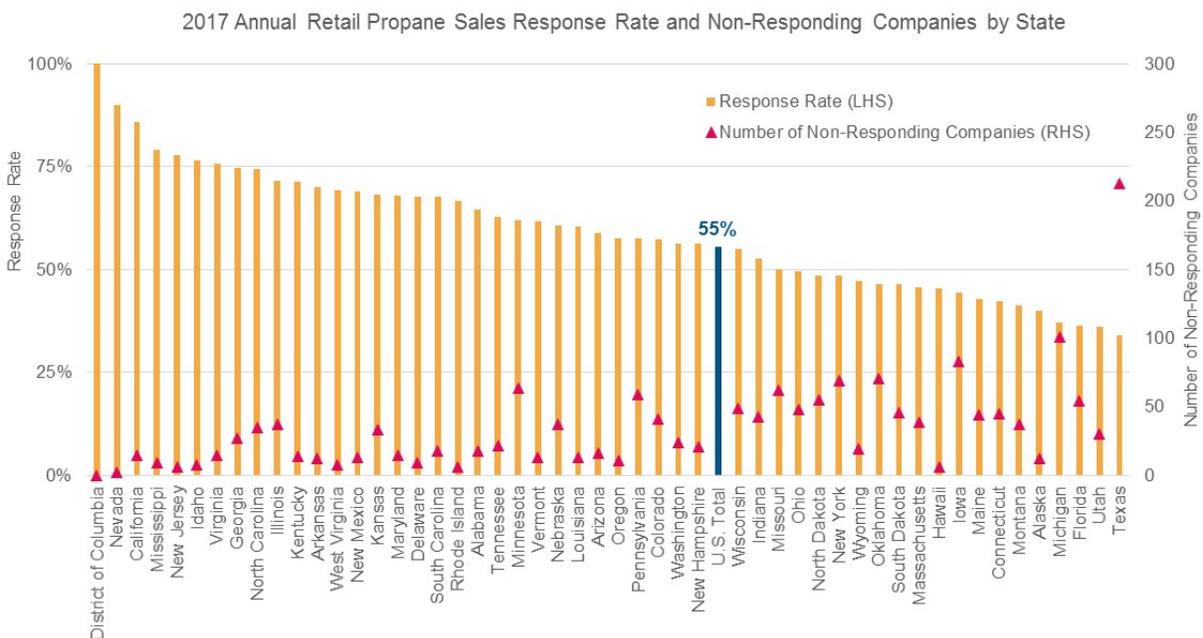
- **Investor Owned:** This category included all known public propane retailers, including those not headquartered in the U.S. but with active sales.
- **Cooperatives:** Co-ops are generalized as a corporate structure or organization that is run for the shared benefit of its members. Included in this category are all major cooperatives, as published in LP Gas' 2018 Retailer Rankings (February 2018) as well as any self-reported or known co-op.

- **Regional:** This category includes private companies that reported operations in two or more states, or reported retail propane sales greater than 10 million gallons within one state.
- **Private:** This category includes all private retail propane companies. Companies that did not provide a response was provided and where no publicly available information was available were categorized as private firms.

ICF and PERC conducted direct phone calls and emails, in addition to the standard survey-based outreach methods, to the largest propane retailers to ensure a 100% response from the largest propane retailers, including all of the investor owned companies as well as the major co-ops, and regional companies.

The response rate and number of companies that were active within a given state, but did not provide information on the company sales is a key metric used in the estimation of total retail propane sales within each state. The chart below shows the response rate and number of non-responding companies for each state.

The national response rate was 55%, shown in the figure below, representing over 1,200 unique companies and over 2,200 submissions for state-level sales volumes.



To create a state-level response rates for the private company category, ICF categorized each reported private company into two separate designations. These designations were customized for each state and region based on the average size of private company response within that state and region.

- **Large:** Companies that meet a region and state level designation for being a large private company.
- **Small:** Companies that meet a region and state level designation for being a small private company. This designation typically reported sales less than 5 million gallons for 2017.

ICF then used the small company participant list that have reported sales to develop a profile for a private company that has not provided sales information for the 2017 Retail Propane Sales Report.

This profile includes total company sales for each state and region as well as an end-use sector breakout of those sales volumes. This profile is then used in the estimation of state and end-use retail propane sales.

Adjustments to Corporate Structure

During the outreach to each participant, ICF asked for any details related to changes in the company's corporate structure, including acquisitions, mergers, divestments or other changes. Additionally, ICF and PERC conducted a review of publicly available information on reported mergers and acquisitions to identify any changes that needed to be accounted for during 2017. This information was used to during the verification and data checking stage to ensure that sales were reported properly.

Estimation of State and End-Use Retail Propane Sales

The Annual Retail Propane Sales Report uses a survey-based data gathering approach to gather information on the total sales breakouts by state, end-use category and company type from domestic propane retailers. This information is used to develop the final reported state-level sales by end-use category.

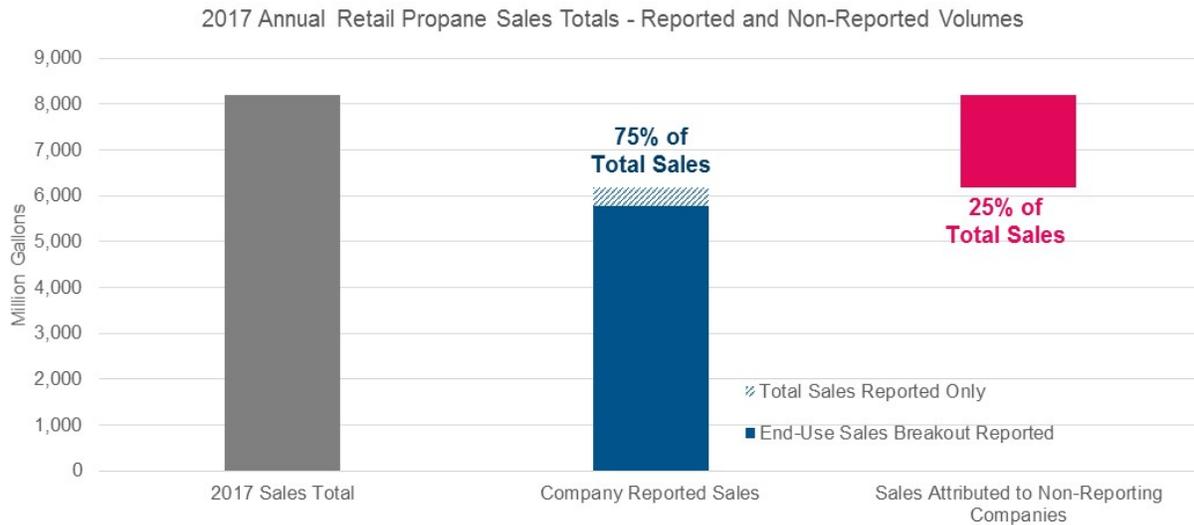
To develop the total domestic retail propane sales number, ICF uses information on the total volumes of propane odorized provided by PERC. This number represents the total volumes that PERC collects assessments on in a given calendar year. There is a difference between the total volumes of odorized propane in a given year and total sales to end users. Several factors for differences in sales versus odorization assessments include, changes in propane storage levels, timing of sales to end-users, volumes in transit, customer refilling schedules, as well as others. ICF makes adjustments to the total reported assessment volumes based on changes in storage levels and weather patterns to account for these differences.

Using publicly available information on propane production, movements, imports, exports, changes in storage levels, as well as information on the volumes of propane used within the petrochemical sector, ICF develops an independent assessment of expected retail propane consumption within the U.S. Given the unique nature of the retail propane industry and differences in treatment of odorized and non-odorized propane, this sales assessment is used only as a reference point against the PERC assessment totals.

Differences in Sales Volume Reporting and Assessment Totals

For the 2017 Retail Propane Sales Report, the total U.S. sales volume was 8,205 million gallons of propane. The companies that participated in the study reported 6,174 million gallons of propane sales, representing 75% of 2017 total retail propane sales. ICF attributed the remaining calculated a total of 2,031 million gallons, or roughly 25% of the 2017 total retail propane sales, to the companies that did not report sales volumes.

The majority of sales volumes reported from propane retailers were attributed to an end-use sector. Less than 7% of reported sales were reported only as a total for the participating company.



Non-Reported Sales Volume Assessments

The majority of total retail propane sales by state were derived through the reported sales volumes of company participants. However, as with any survey-based approach there was less than 100% response rate, and the response rate varied from state to state. To allocate the volumes for the non-reported assessment, ICF developed a multi-step process to allocate un-reported sales volumes to each state. These steps included the following:

- Step One: ICF created a sample set of companies that had provided both total sales and sales by end-use category. This sample set included only companies that were categorized as Private and were also categorized as a small company in the state and regional breakouts.
- Step Two: Using the number of non-responding companies within each state, ICF calculated an estimate of the total sales volumes associated with non-responding companies.
- Step Three: This estimate was then reviewed for data accuracy and benchmarked on a state and regional basis using average company size, reported gallons, number of accounts as well as several additional metrics.
- Step Four: ICF then compared the total volume estimate that was created by steps one through three to the assessment of total non-reported sales, 2,031 million gallons, and scaled the estimation of total non-reported volumes to match the U.S. odorized propane sales control total.

Total State Level Sales Volume by End-Use Category

To ensure an accurate reporting of end-use sales, company sales volumes not reported by end-use sector were allocated to specific sectors. This was done through a two-step process.

- Step One: Using the four company type categories, ICF developed a breakout of the percent of end-use sales for each company category and state
- Step Two: Following a review of the categorization of each company that only reported total company sales, ICF then developed the sales by end-use category for each company within each state.



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