

**Table C35. Fuel oil consumption and conditional energy intensity by census region, 2018**

	Total fuel oil consumption (million gallons)				Total floorspace of buildings using fuel oil (million square feet)				Fuel oil energy intensity (gallons/thousand square feet)			
	North- east	Mid- west	South	West	North- east	Mid- west	South	West	North- east	Mid- west	South	West
<b>All buildings</b>	500	77	98	Q	5,930	4,585	6,794	3,875	84.4	16.7	14.4	Q
<b>Building floorspace (square feet)</b>												
1,001 to 10,000	203	Q	Q	Q	695	Q	294	Q	292.0	Q	72.3	Q
10,001 to 100,000	144	35	37	Q	2,020	1,390	2,155	929	71.5	24.9	17.1	Q
Over 100,000	153	36	40	10	3,214	2,912	4,345	2,718	47.6	12.4	9.2	3.6
<b>Principal building activity</b>												
Education	155	17	31	Q	1,189	587	725	209	130.5	28.8	43.2	Q
Health care	22	16	7	Q	449	807	732	510	48.0	20.1	9.9	Q
Office	65	5	12	2	1,466	919	2,046	988	44.5	5.2	5.7	2.0
All others	258	39	48	Q	2,826	2,272	3,291	2,168	91.5	17.0	14.5	Q
<b>Year constructed</b>												
Before 1945	163	14	12	Q	1,111	587	398	245	146.9	Q	31.1	Q
1946 to 1979	184	24	39	Q	1,944	1,470	1,900	732	94.8	16.0	20.3	Q
1980 to 1999	99	13	24	Q	1,686	1,031	2,197	1,317	58.4	13.1	11.1	Q
2000 to 2018	55	26	23	Q	1,189	1,498	2,299	1,581	45.9	17.1	9.8	Q
<b>Climate zone<sup>a</sup></b>												
Cold or very cold	88	27	N	Q	527	964	N	Q	167.6	28.3	N	Q
Cool	263	38	N	Q	2,283	2,452	N	1,048	115.1	15.6	N	Q
Mixed mild	149	11	49	4	3,120	1,169	2,444	Q	47.9	9.4	20.1	3.4
Warm	N	N	36	2	N	N	2,391	1,135	N	N	14.9	2.1
Hot or very hot	N	N	13	Q	N	N	1,960	459	N	N	6.8	2.2
<b>Number of floors</b>												
1	157	19	35	Q	1,193	1,238	1,643	836	131.6	15.4	21.3	Q
2	187	14	32	Q	1,081	822	1,223	617	173.4	17.1	25.8	Q
3	42	22	Q	Q	855	645	691	205	49.3	34.4	Q	Q
4 to 9	89	10	17	Q	1,736	1,105	1,982	1,256	51.5	9.0	8.5	Q
10 or more	Q	11	Q	2	1,064	775	1,255	961	Q	14.6	Q	2.1
<b>Number of workers (main shift)</b>												
Fewer than 10	199	26	36	Q	1,086	610	843	263	183.1	42.1	42.5	Q
10 to 99	207	18	34	Q	2,108	1,328	2,151	1,091	98.1	13.5	15.9	Q
100 or more	95	33	28	9	2,736	2,647	3,800	2,520	34.6	12.5	7.3	3.5
<b>Weekly operating hours</b>												
Fewer than 48	162	14	34	Q	1,142	895	1,316	558	141.8	15.2	25.5	Q
49 to 84	190	13	37	Q	2,213	1,317	2,443	1,276	86.0	9.7	15.1	Q
85 to 167	Q	5	1	Q	692	657	508	473	Q	7.5	2.1	Q
Open continuously	96	45	26	Q	1,883	1,717	2,527	1,569	51.1	26.3	10.5	Q
<b>Ownership and occupancy</b>												
Nongovernment owned	323	53	37	Q	4,398	3,359	4,256	2,797	73.5	15.7	8.7	Q
Owner occupied	221	51	24	17	2,784	2,409	2,901	1,499	79.4	21.1	8.4	Q
Leased to tenant or tenants	102	2	12	Q	1,596	950	1,330	1,286	64.1	1.9	9.4	Q
Unoccupied	Q	N	Q	Q	Q	N	Q	Q	Q	N	Q	Q
Government owned	177	24	61	Q	1,532	1,226	2,539	1,078	115.6	19.6	24.0	Q
Federal	Q	Q	8	Q	Q	Q	471	Q	Q	Q	16.4	Q
State	19	Q	Q	Q	488	Q	663	352	38.9	Q	Q	Q
Local	156	19	44	Q	931	915	1,405	563	167.6	21.3	31.7	Q

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	North- east	Mid- west	South	West	North- east	Mid- west	South	West	North- east	Mid- west	South	West
<b>All buildings</b>	500	77	98	Q	5,930	4,585	6,794	3,875	84.4	16.7	14.4	Q
<b>Party responsible for operation of energy systems</b>												
Building owner	456	75	86	Q	5,062	3,701	5,924	3,122	90.1	20.3	14.6	Q
Business owner or tenant	35	1	6	Q	598	497	417	507	58.6	1.3	Q	Q
Property management	Q	Q	Q	Q	Q	Q	297	Q	Q	Q	Q	Q
Other	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q
<b>Provider of direct input on energy-related equipment purchases</b>												
Building owner	468	76	87	Q	5,185	3,937	6,080	3,203	90.3	19.2	14.3	Q
Business owner or tenant	25	Q	6	Q	427	Q	278	Q	59.1	Q	Q	Q
Property management	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q
Other	Q	Q	Q	Q	220	Q	223	362	18.2	Q	Q	Q
<b>Number of establishments</b>												
1	411	53	76	Q	3,892	3,108	4,064	2,141	105.7	17.2	18.7	Q
2 to 5	71	14	9	4	1,064	771	1,145	1,045	66.9	17.7	8.0	4.1
6 to 10	1	Q	1	Q	314	Q	495	Q	3.5	Q	2.4	Q
11 to 20	Q	Q	Q	Q	Q	Q	416	Q	Q	Q	Q	Q
More than 20	Q	Q	7	0	400	347	644	328	40.6	Q	10.6	1.3
Currently unoccupied	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q
<b>Predominant exterior wall material</b>												
Brick, stone, or stucco	273	42	57	5	3,134	1,781	3,426	1,462	87.1	23.4	16.8	3.3
Concrete (block or poured)	51	21	Q	Q	916	1,137	1,183	853	55.3	18.4	Q	Q
Concrete panels	2	4	Q	1	375	691	1,020	598	6.5	5.4	7.0	1.4
Siding or shingles	128	Q	Q	Q	633	Q	Q	Q	202.8	Q	Q	Q
Metal panels	36	Q	8	Q	489	535	565	Q	73.3	Q	15.0	Q
Window glass	1	Q	1	1	245	Q	423	389	2.5	Q	2.1	2.7
Other	Q	Q	Q	Q	Q	Q	Q	276	Q	Q	Q	Q
<b>Predominant roof material</b>												
Metal surfacing	57	Q	34	Q	689	686	1,065	337	82.7	Q	32.3	Q
Synthetic or rubber	136	43	27	Q	2,438	1,965	2,724	1,755	55.8	21.7	9.7	Q
Built-up	110	20	14	3	1,249	1,363	1,685	1,028	87.8	14.8	8.5	3.1
Slate or tile shingles	Q	Q	Q	Q	Q	Q	235	Q	Q	Q	Q	Q
Wooden materials (including shingles)	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q
Asphalt, fiberglass, or other shingles	165	Q	Q	1	1,018	222	418	384	162.3	Q	Q	2.7
Concrete	Q	Q	Q	Q	Q	Q	286	Q	Q	Q	Q	Q
Other	Q	Q	Q	Q	Q	Q	352	Q	Q	Q	Q	Q
<b>Roof tilt</b>												
Flat	186	67	56	Q	3,964	3,371	4,818	2,823	47.0	20.0	11.7	Q
Shallow pitch	133	Q	31	Q	878	935	1,265	764	151.0	Q	24.8	Q
Steeper pitch	182	Q	10	Q	1,088	280	712	288	166.9	Q	14.5	Q





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	North- east	Mid- west	South	West	North- east	Mid- west	South	West	North- east	Mid- west	South	West
<b>All buildings</b>	500	77	98	Q	5,930	4,585	6,794	3,875	84.4	16.7	14.4	Q
<b>HVAC features (more than one may apply)</b>												
Economizer cycle	143	55	36	Q	3,125	2,835	3,543	2,710	45.9	19.5	10.2	Q
Variable air volume (VAV) system	74	56	40	Q	2,691	2,676	3,884	2,412	27.5	20.9	10.4	Q
Dedicated outside air system (DOAS)	Q	16	16	Q	874	893	1,493	733	Q	18.3	11.0	Q
Demand controlled ventilation (DCV)	134	17	17	Q	1,186	771	1,111	554	112.8	22.4	15.0	Q
Regular HVAC maintenance	447	69	80	Q	5,243	4,266	6,435	3,800	85.3	16.2	12.4	Q
Building automation system (BAS) controls heating or cooling	197	59	49	Q	3,383	2,952	4,816	3,068	58.3	20.1	10.2	Q
Internet-connected or smart thermostat	Q	Q	Q	Q	Q	Q	353	Q	Q	Q	Q	Q
Programmable thermostat	133	8	18	Q	1,045	527	761	375	127.5	14.3	23.5	Q
<b>Water-heating equipment</b>												
Centralized system	366	61	58	Q	3,842	3,069	3,993	2,251	95.4	19.9	14.4	Q
Distributed system	Q	4	Q	1	886	398	858	466	Q	11.2	30.1	2.2
Combination of centralized and distributed systems	35	9	12	5	1,064	1,032	1,692	1,107	32.4	8.4	7.2	4.9
<b>Generation technologies (more than one may apply)</b>												
Reciprocating engine generators	194	58	47	34	4,064	3,976	5,861	3,297	47.7	14.5	8.0	Q
Solar panels	3	Q	Q	Q	402	Q	Q	Q	8.5	Q	Q	Q
Other generation technology	Q	Q	1	0	Q	Q	387	297	Q	Q	3.2	1.5
<b>Food preparation or serving areas in non-food service buildings (more than one may apply)</b>												
Snack bar, concession stand, or coffee shop	22	16	14	5	982	971	1,622	1,189	22.8	16.5	8.8	4.6
Fast food or small restaurant	28	9	Q	Q	729	574	1,106	863	38.8	14.9	Q	Q
Cafeteria or large restaurant	144	29	27	4	1,642	1,548	2,119	1,171	87.5	19.0	13.0	3.8
Commercial kitchen or food preparation area	82	25	24	Q	1,543	1,705	2,054	1,247	53.3	14.6	11.8	Q
Small kitchen area	127	24	19	Q	1,852	1,378	1,754	1,267	68.8	17.4	10.9	Q

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	North- east	Mid- west	South	West	North- east	Mid- west	South	West	North- east	Mid- west	South	West
<b>All buildings</b>	500	77	98	Q	5,930	4,585	6,794	3,875	84.4	16.7	14.4	Q
<b>Annual consumption (gallons)</b>												
1,000 or less	53	14	19	11	3,123	2,982	5,038	2,818	16.9	4.8	3.8	4.0
1,001 to 5,000	130	20	30	Q	1,483	880	1,024	803	87.5	22.8	29.2	Q
5,001 to 10,000	131	Q	Q	Q	420	Q	Q	Q	311.0	Q	Q	Q
10,001 to 25,000	54	Q	Q	Q	459	Q	Q	Q	117.6	Q	Q	Q
Over 25,000	133	Q	Q	Q	444	Q	Q	Q	299.7	Q	Q	Q

Data source: U.S. Energy Information Administration, Forms EIA-871A and F of the *2018 Commercial Buildings Energy Consumption Survey*

Notes: Because of rounding, data may not sum to totals. The *Guide to the 2018 CBECS Tables* and *CBECS Terminology* contain definitions of terms used in these tables and comparisons between previous CBECS tables. You can access both references from <http://www.eia.gov/consumption/commercial/data/2018/>.

Data are sample survey estimates with relative standard errors published in a tab on the Excel worksheet for this table.

Estimates in the *energy end uses* category represent total consumption in buildings that have the end use but not the consumption specifically for that end use.

HVAC = Heating, ventilation, and air conditioning.

<sup>a</sup>Climate zones are based on ASHRAE Standard 169-2021; see <https://www.eia.gov/consumption/commercial/maps.php#defined>.

<sup>b</sup>Other sources includes wood, coal, solar, and all other energy sources.

Q = Data withheld either because the relative standard error was greater than 50% or the reporting sample had fewer than 20 buildings.

N = No buildings in reporting sample.

**Relative standard errors (RSEs) for Table C35. Fuel oil consumption and conditional energy intensity by census region, 2018**

	RSEs for total fuel oil consumption				RSEs for total floorspace of buildings using fuel oil				RSEs for fuel oil energy intensity			
	North-east	Mid-west	South	West	North-east	Mid-west	South	West	North-east	Mid-west	South	West
<b>All buildings</b>	23.1	14.8	16.8	61.0	10.3	10.3	7.9	17.2	17.7	13.2	18.9	61.2
<b>Building floorspace (square feet)</b>												
1,001 to 10,000	27.5	63.5	58.6	97.9	17.7	70.2	28.9	28.1	21.7	153.6	43.0	96.8
10,001 to 100,000	26.0	26.6	34.3	72.4	13.1	17.8	11.5	21.3	17.9	26.5	33.0	71.0
Over 100,000	38.8	19.7	19.8	23.4	11.7	12.2	10.0	20.6	34.8	20.8	20.5	20.1
<b>Principal building activity</b>												
Education	39.7	25.8	30.9	108.5	19.4	22.2	23.0	35.2	32.4	39.0	32.0	108.6
Health care	41.5	30.4	19.5	90.9	20.1	15.0	10.4	19.4	32.8	28.6	18.9	88.9
Office	41.3	36.7	25.4	22.4	16.1	20.4	19.8	16.9	35.5	42.8	21.0	14.4
All others	22.4	26.0	28.6	64.7	11.3	13.1	10.4	23.2	17.2	23.7	29.6	67.3
<b>Year constructed</b>												
Before 1945	32.0	43.9	45.5	77.3	25.5	41.4	40.1	37.7	25.0	62.0	45.7	65.2
1946 to 1979	27.7	32.2	35.3	56.4	14.1	18.6	10.9	18.1	23.9	26.4	33.1	58.0
1980 to 1999	33.2	36.8	27.5	65.9	16.3	16.8	11.2	29.8	26.3	38.6	31.6	71.5
2000 to 2018	40.0	27.6	38.3	69.1	17.1	17.1	14.6	21.6	32.1	24.2	35.5	69.2
<b>Climate zone<sup>a</sup></b>												
Cold or very cold	21.5	25.4	0.0	66.4	19.3	24.4	0.0	42.6	14.8	14.4	0.0	50.0
Cool	39.7	31.2	0.0	71.4	16.6	18.2	0.0	24.6	30.0	26.5	0.0	72.0
Mixed mild	25.3	48.6	15.6	44.8	16.2	26.1	20.6	54.3	15.7	35.3	27.5	37.2
Warm	0.0	0.0	41.4	14.4	0.0	0.0	14.4	16.4	0.0	0.0	36.8	5.3
Hot or very hot	0.0	0.0	31.4	52.6	0.0	0.0	15.6	26.9	0.0	0.0	27.8	32.5
<b>Number of floors</b>												
1	32.5	24.5	27.8	52.4	17.9	22.8	14.3	21.5	27.0	25.1	28.0	54.6
2	28.0	49.1	45.1	68.6	18.2	19.5	15.7	24.8	25.8	47.2	37.5	62.9
3	22.9	31.9	54.0	77.4	18.9	21.8	16.1	26.8	23.1	23.5	58.6	71.4
4 to 9	28.2	31.9	39.7	73.8	15.6	16.5	11.7	18.2	21.1	25.4	39.6	74.2
10 or more	66.5	35.8	70.1	38.4	17.0	36.2	25.5	38.6	61.7	36.2	59.5	20.7
<b>Number of workers (main shift)</b>												
Fewer than 10	28.1	37.7	37.7	96.1	20.1	33.3	16.2	25.4	22.5	35.5	29.5	96.4
10 to 99	39.1	26.7	26.6	67.8	12.3	14.1	8.8	15.4	32.6	32.9	27.5	66.3
100 or more	29.7	21.0	15.7	25.8	11.7	12.6	10.5	21.1	26.2	22.0	19.8	21.1
<b>Weekly operating hours</b>												
Fewer than 48	30.6	37.6	42.1	93.9	16.7	22.9	14.0	18.5	25.5	30.4	40.2	91.5
49 to 84	27.1	28.8	18.5	59.5	14.0	19.6	13.9	16.0	21.4	39.9	22.8	60.3
85 to 167	70.1	41.7	23.6	53.7	20.7	32.1	23.4	35.6	68.3	44.5	19.2	50.9
Open continuously	20.6	21.3	23.2	61.4	11.4	11.1	11.3	27.6	18.2	16.9	21.7	64.0
<b>Ownership and occupancy</b>												
Nongovernment owned	23.9	23.9	16.2	54.7	11.4	11.4	9.7	18.6	17.9	21.0	18.0	55.0
Owner occupied	23.5	24.9	20.3	47.7	14.4	13.8	9.7	27.4	14.9	21.6	18.1	50.9
Leased to tenant or tenants	34.1	28.6	33.2	81.0	14.0	20.8	16.2	19.2	34.1	29.0	42.1	80.8
Unoccupied	68.8	0.0	106.2	77.8	68.8	0.0	82.6	77.8	0.0	0.0	187.5	0.1
Government owned	29.7	25.0	28.1	68.9	16.5	14.2	10.2	20.0	28.1	28.1	27.4	68.4
Federal	78.1	38.4	33.1	105.3	44.3	44.5	43.2	56.9	72.7	22.2	30.9	93.3
State	36.0	96.6	81.2	64.4	27.3	33.8	18.2	26.9	31.5	98.9	88.9	63.6
Local	33.3	26.0	36.1	100.4	19.9	13.2	15.0	24.2	30.1	29.2	32.7	96.8

Relative standard errors (RSEs) for Table C35. Fuel oil consumption and conditional energy intensity by census region, 2018

	RSEs for total fuel oil consumption				RSEs for total floorspace of buildings using fuel oil				RSEs for fuel oil energy intensity			
	North-east	Mid-west	South	West	North-east	Mid-west	South	West	North-east	Mid-west	South	West
<b>All buildings</b>	23.1	14.8	16.8	61.0	10.3	10.3	7.9	17.2	17.7	13.2	18.9	61.2
<b>Party responsible for operation of energy systems</b>												
Building owner	24.1	15.1	18.3	55.3	9.9	12.1	7.6	19.2	19.1	14.0	20.7	56.7
Business owner or tenant	37.8	34.3	37.2	98.3	28.9	30.9	34.7	37.5	29.6	16.6	50.7	101.9
Property management	96.3	52.8	100.4	111.6	27.7	31.0	28.3	56.9	97.8	30.6	96.6	127.2
Other	78.5	50.3	68.0	105.5	37.9	55.1	35.6	32.7	74.4	32.1	70.5	109.3
<b>Provider of direct input on energy-related equipment purchases</b>												
Building owner	23.4	15.0	18.2	55.0	10.0	12.6	7.4	19.5	18.6	14.6	20.6	56.4
Business owner or tenant	45.1	37.1	39.7	26.0	36.3	38.4	30.1	32.8	41.2	22.1	51.9	18.1
Property management	99.7	76.0	104.0	111.8	35.1	63.0	35.0	72.3	98.6	30.9	101.0	111.9
Other	50.2	41.9	52.2	105.3	26.0	43.6	34.2	41.6	43.4	6.8	55.2	108.2
<b>Number of establishments</b>												
1	26.3	17.0	21.4	66.8	11.5	13.3	8.0	15.7	19.3	15.1	23.1	66.4
2 to 5	29.6	49.9	32.8	29.3	20.2	16.9	19.8	36.9	19.7	49.0	34.9	43.3
6 to 10	48.0	94.1	24.6	51.2	35.3	58.1	21.4	29.8	24.3	125.1	20.2	38.9
11 to 20	59.7	42.8	89.5	27.5	35.0	20.8	24.2	27.5	55.9	43.8	86.0	14.8
More than 20	60.1	58.7	31.4	32.0	30.7	25.4	23.5	25.2	40.8	61.6	21.8	7.4
Currently unoccupied	68.8	50.8	103.3	77.8	68.8	50.8	54.8	77.8	0.0	0.0	112.4	0.1
<b>Predominant exterior wall material</b>												
Brick, stone, or stucco	34.9	17.2	21.7	29.4	13.8	9.6	8.3	31.0	29.0	15.0	24.1	30.4
Concrete (block or poured)	36.6	33.8	66.1	81.4	22.4	26.3	13.8	22.4	23.5	35.6	64.4	81.0
Concrete panels	34.8	47.5	61.0	22.0	20.5	26.6	26.5	20.5	35.0	48.3	49.2	6.5
Siding or shingles	22.2	86.6	110.2	101.9	24.5	56.1	59.6	34.7	13.5	70.1	129.2	95.9
Metal panels	38.0	61.6	34.4	103.9	25.9	24.8	16.3	19.8	27.0	67.3	33.1	110.1
Window glass	30.4	29.2	19.9	40.9	23.8	24.2	22.6	33.4	25.6	15.6	17.6	39.7
Other	85.7	49.6	62.3	96.8	37.4	46.7	38.8	32.3	79.1	24.3	52.2	97.8
<b>Predominant roof material</b>												
Metal surfacing	32.8	54.7	44.6	72.2	23.1	22.2	14.9	23.1	28.5	51.2	39.6	72.1
Synthetic or rubber	41.2	23.1	20.8	75.1	14.5	14.8	11.0	19.0	38.2	18.6	20.0	72.9
Built-up	38.0	31.8	29.8	43.5	19.4	20.5	13.4	32.0	31.0	31.1	30.6	44.6
Slate or tile shingles	50.1	49.6	57.8	88.7	37.8	47.7	32.9	92.1	27.6	15.7	52.2	15.6
Wooden materials (including shingles)	50.1	52.2	91.6	111.5	50.1	52.2	91.4	60.8	0.0	0.0	1.0	102.1
Asphalt, fiberglass, or other shingles	24.0	59.4	53.2	33.1	20.4	46.8	20.1	29.2	13.5	58.4	54.5	29.8
Concrete	51.3	99.6	54.5	58.7	35.0	82.1	24.0	36.5	24.2	31.4	50.9	51.5
Other	48.8	101.6	72.6	45.3	32.7	39.4	30.9	44.5	51.8	99.4	65.1	10.8
<b>Roof tilt</b>												
Flat	34.8	15.2	13.1	56.0	12.3	11.6	9.0	20.1	30.3	15.4	19.2	57.8
Shallow pitch	40.1	55.5	46.0	59.1	22.2	22.4	17.1	24.7	36.3	54.6	44.1	60.1
Steeper pitch	24.3	83.4	37.2	109.5	21.4	37.3	21.9	42.1	13.9	70.7	32.1	101.3



Relative standard errors (RSEs) for Table C35. Fuel oil consumption and conditional energy intensity by census region, 2018

	RSEs for total fuel oil consumption				RSEs for total floorspace of buildings using fuel oil				RSEs for fuel oil energy intensity			
	North-east	Mid-west	South	West	North-east	Mid-west	South	West	North-east	Mid-west	South	West
<b>All buildings</b>	23.1	14.8	16.8	61.0	10.3	10.3	7.9	17.2	17.7	13.2	18.9	61.2
<b>Cool roof characteristics (more than one may apply)</b>												
White or reflective coating or paint	41.7	27.3	42.0	78.5	15.5	20.3	12.6	24.4	36.3	25.6	37.5	78.0
White or reflective tiles or shingles	58.3	67.1	44.9	46.1	28.3	39.7	23.8	33.8	60.9	51.1	38.1	41.2
Aluminum coating	51.9	107.3	83.1	59.7	34.8	45.7	28.7	33.1	50.0	113.3	74.7	54.8
Ballasted roof system	54.2	39.0	37.5	57.9	20.5	21.3	19.9	51.5	52.7	28.8	54.9	13.1
Other cool roof property	50.7	65.6	107.2	107.6	31.2	44.7	68.2	31.1	47.4	67.3	95.0	122.1
<b>Renovations since 2000 (more than one may apply)</b>												
Any type of renovation	29.5	13.9	17.6	65.8	12.0	9.8	9.6	18.4	24.9	15.3	22.1	65.1
Addition or annex	39.9	25.8	48.4	37.0	19.8	14.9	18.2	22.1	33.3	27.0	41.5	35.7
Reduction in floorspace	67.1	31.8	53.9	106.7	35.9	31.7	30.6	52.3	64.5	14.2	51.4	99.9
Roof replacement	28.6	18.0	30.1	86.1	13.2	10.5	14.2	32.2	25.0	16.4	27.7	85.9
Interior wall reconfiguration	28.7	18.3	37.9	69.5	13.8	15.2	12.4	26.1	22.6	24.9	36.4	72.3
Window replacement	37.9	27.0	45.1	83.4	15.4	22.9	21.3	41.9	34.2	35.9	42.5	93.5
HVAC equipment upgrade	43.8	16.9	25.4	83.7	14.0	13.3	11.8	22.4	38.7	22.0	25.9	82.3
Lighting upgrade	36.8	19.4	31.7	66.0	12.1	11.0	10.3	21.4	34.8	22.0	35.0	64.1
Electrical upgrade	34.3	21.1	33.4	69.9	15.2	18.4	13.9	30.6	31.7	25.8	32.6	72.2
Plumbing system upgrade	27.8	20.0	42.6	75.7	14.9	19.5	11.6	29.4	23.2	28.2	41.3	75.6
Insulation upgrade	32.6	27.4	40.0	83.7	21.8	33.8	19.8	43.6	30.9	50.0	39.5	97.3
Fire, safety, or security upgrade	32.0	19.7	41.0	73.2	15.9	11.2	11.8	29.8	28.5	19.3	42.3	73.0
Structural upgrade	60.8	61.8	80.9	92.2	24.4	46.0	24.4	55.4	58.7	77.9	79.6	121.9
Other	81.0	0.0	43.8	89.0	49.2	0.0	42.0	87.2	71.0	0.0	6.8	15.2
No renovations	27.8	27.0	31.8	59.0	12.6	17.1	12.3	20.0	26.9	20.9	27.5	60.2
Buildings constructed 2013 or later	63.5	61.6	43.8	54.0	33.1	36.8	28.7	32.9	30.0	57.8	32.3	51.5
<b>Energy sources (more than one may apply)</b>												
Electricity	23.1	14.8	16.8	61.0	10.3	10.3	7.9	17.2	17.7	13.2	18.9	61.2
Natural gas	26.5	14.3	32.8	20.7	12.1	11.2	8.8	19.4	19.5	14.9	30.9	20.5
Fuel oil	23.1	14.8	16.8	61.0	10.3	10.3	7.9	17.2	17.7	13.2	18.9	61.2
District heat	45.9	51.2	27.8	47.9	13.9	34.0	26.7	31.0	47.6	45.1	26.6	38.4
District chilled water	81.3	62.5	28.8	42.7	29.3	29.9	20.8	29.0	84.0	52.2	27.2	34.2
Propane	32.7	40.5	61.5	93.6	19.5	23.8	21.1	39.9	23.5	35.1	54.0	102.4
Solar	40.7	59.2	91.4	55.3	31.9	35.0	45.9	47.8	47.0	63.7	83.6	11.9
Wood, coal, and other	64.6	85.2	48.7	92.5	38.6	45.6	40.6	78.1	62.5	82.5	47.2	321.9
<b>Space-heating energy sources</b>												
Fuel oil	23.7	11.9	23.3	74.9	16.6	18.5	23.4	41.6	13.6	13.7	25.4	48.7
Fuel oil main	25.6	23.5	28.7	81.0	18.7	30.9	29.8	74.0	13.8	12.9	6.4	20.7
Fuel oil secondary	22.5	14.8	49.3	43.9	20.4	20.5	53.3	29.9	15.7	15.6	11.8	44.3
Other excluding fuel oil	33.2	29.7	18.2	21.7	10.5	10.5	8.5	18.6	31.1	28.1	18.0	18.5
Buildings without heating	52.8	0.0	54.3	78.3	71.0	0.0	36.0	44.7	66.6	0.0	38.3	83.4
<b>Primary space-heating energy source</b>												
Electricity	27.3	37.5	26.8	35.5	18.7	26.8	11.7	21.1	20.5	31.6	32.4	18.5
Natural gas	24.8	13.9	36.9	22.9	12.6	12.8	11.9	25.2	21.7	14.6	31.9	30.6
Fuel oil	25.6	23.5	28.7	81.0	18.7	30.9	29.8	74.0	13.8	12.9	6.4	20.7
District heat	47.1	33.1	30.2	49.2	16.3	35.7	26.9	30.4	49.4	18.3	28.6	40.7
Propane	96.1	70.6	61.4	50.2	72.5	70.6	61.4	50.2	86.3	0.0	0.1	0.0
Other sources <sup>b</sup>	76.4	92.5	60.4	109.3	59.7	98.1	60.4	43.9	22.1	517.4	0.0	109.0

Relative standard errors (RSEs) for Table C35. Fuel oil consumption and conditional energy intensity by census region, 2018

	RSEs for total fuel oil consumption				RSEs for total floorspace of buildings using fuel oil				RSEs for fuel oil energy intensity			
	North-east	Mid-west	South	West	North-east	Mid-west	South	West	North-east	Mid-west	South	West
<b>All buildings</b>	23.1	14.8	16.8	61.0	10.3	10.3	7.9	17.2	17.7	13.2	18.9	61.2
<b>Cooling energy sources</b>												
Fuel oil	49.7	0.0	72.4	0.0	49.7	0.0	72.4	0.0	0.0	0.0	0.0	0.0
Other excluding fuel oil	25.1	14.2	17.5	59.7	10.8	9.8	7.9	17.7	19.8	13.7	19.5	60.6
Buildings without cooling	29.8	78.8	78.7	109.8	30.5	63.0	64.1	33.5	20.2	35.5	144.6	104.8
<b>Water-heating energy sources</b>												
Fuel oil	27.5	39.6	28.4	77.2	20.3	28.2	40.6	39.2	15.2	26.8	54.7	66.2
Other excluding fuel oil	31.5	16.4	20.6	46.7	10.2	10.3	7.5	17.7	28.5	16.4	21.2	48.0
Buildings without water heating	62.4	106.8	70.2	95.0	59.7	74.0	35.6	44.8	39.1	192.7	78.4	90.3
<b>Cooking energy sources</b>												
Fuel oil	58.8	0.0	62.4	94.6	54.5	0.0	77.4	67.0	57.9	0.0	200.6	184.5
Other excluding fuel oil	24.0	15.4	21.2	75.3	12.2	12.6	9.2	20.7	20.1	14.7	22.3	73.6
Buildings without cooking	28.4	33.0	33.7	66.6	12.1	17.7	12.0	18.9	23.6	30.6	30.7	67.7
<b>Energy end uses (more than one may apply)</b>												
Buildings with space heating	23.2	14.8	17.2	61.4	10.3	10.3	8.3	17.7	17.8	13.2	19.4	61.7
Buildings with cooling	25.1	14.2	17.3	59.7	10.8	9.8	7.9	17.7	19.8	13.7	19.3	60.6
Buildings with water heating	23.8	14.9	17.3	60.3	10.8	10.2	7.9	17.5	18.1	13.2	19.4	60.9
Buildings with cooking	23.7	15.4	19.2	73.7	12.2	12.6	9.2	19.8	19.8	14.7	20.5	72.0
Buildings with manufacturing	43.5	82.4	50.2	49.9	37.0	38.0	28.7	37.5	56.7	77.9	50.3	30.6
Buildings with electricity generation	27.2	21.6	24.8	47.9	10.0	11.2	8.7	18.7	25.1	18.8	23.9	49.6
Buildings with lighting	23.1	14.8	16.8	61.0	10.3	10.3	7.9	17.2	17.7	13.2	18.9	61.2
<b>Percent of floorspace heated</b>												
Not heated	52.8	0.0	54.3	78.3	71.0	0.0	36.0	44.7	66.6	0.0	38.3	83.4
1% to 50%	43.0	38.9	32.7	98.2	38.3	29.8	18.8	39.0	13.0	41.5	32.9	109.6
51% to 99%	35.7	41.1	28.4	44.7	16.9	28.3	17.0	16.5	27.3	30.3	20.5	43.6
100%	27.1	20.2	23.7	61.7	10.0	12.5	8.2	23.6	23.3	16.3	24.2	63.6
<b>Heating equipment (more than one may apply)</b>												
Packaged heating units	24.0	24.6	30.8	65.1	11.0	13.4	12.2	22.3	19.6	23.2	31.0	66.4
Furnaces	32.5	30.3	58.8	85.2	16.9	27.7	28.7	26.5	26.2	39.2	55.3	84.9
Individual space heaters	33.0	32.2	40.0	65.8	15.4	19.3	9.4	31.7	31.6	27.9	37.1	70.9
Boilers	24.3	15.6	18.1	64.0	12.8	11.4	9.7	23.6	19.7	10.2	18.1	65.4
Heat pumps	35.2	39.1	64.3	94.9	19.2	30.2	12.3	35.2	26.9	43.0	64.3	101.6
District heat	46.6	33.1	29.4	48.6	14.0	35.6	26.8	30.4	48.3	18.2	27.1	40.0
Duct reheat	74.5	53.0	30.4	104.7	21.5	17.2	16.4	25.6	71.8	54.1	36.7	104.9
Other	115.2	112.1	89.6	81.9	111.9	86.4	89.6	81.9	96.1	101.8	0.0	0.0

Relative standard errors (RSEs) for Table C35. Fuel oil consumption and conditional energy intensity by census region, 2018

	RSEs for total fuel oil consumption				RSEs for total floorspace of buildings using fuel oil				RSEs for fuel oil energy intensity			
	North-east	Mid-west	South	West	North-east	Mid-west	South	West	North-east	Mid-west	South	West
<b>All buildings</b>	23.1	14.8	16.8	61.0	10.3	10.3	7.9	17.2	17.7	13.2	18.9	61.2
<b>HVAC features (more than one may apply)</b>												
Economizer cycle	31.2	20.6	16.8	63.1	12.0	11.9	11.9	20.1	27.5	16.7	20.8	64.1
Variable air volume (VAV) system	27.3	17.3	15.4	61.0	10.5	10.9	12.1	19.7	24.8	16.7	22.7	62.4
Dedicated outside air system (DOAS)	58.0	33.5	16.3	89.6	17.2	19.8	18.8	48.9	55.9	25.2	28.2	111.4
Demand controlled ventilation (DCV)	50.0	39.5	34.7	83.4	14.2	26.3	17.9	26.4	43.8	42.7	30.2	81.5
Regular HVAC maintenance	26.2	14.9	15.1	61.7	11.0	9.8	8.0	17.6	20.8	14.1	18.3	62.1
Building automation system (BAS) controls heating or cooling	32.4	22.0	22.3	62.5	11.0	11.8	10.6	19.7	29.1	16.4	25.8	62.4
Internet-connected or smart thermostat	42.5	59.5	62.9	45.5	25.8	59.8	27.7	45.9	30.8	0.7	56.4	42.2
Programmable thermostat	37.0	37.8	38.2	102.6	18.6	16.4	25.1	23.5	30.4	38.5	34.9	99.8
<b>Water-heating equipment</b>												
Centralized system	18.5	18.8	16.6	67.3	12.2	14.3	10.1	23.2	12.7	17.8	20.0	70.6
Distributed system	56.1	45.6	51.2	42.7	20.6	26.5	19.7	27.6	52.9	46.3	46.9	35.5
Combination of centralized and distributed systems	44.5	44.8	35.2	33.8	16.7	16.4	14.1	20.8	38.2	43.8	36.8	31.9
<b>Generation technologies (more than one may apply)</b>												
Reciprocating engine generators	27.6	22.0	26.5	48.2	10.3	12.0	8.9	19.7	25.2	19.6	25.6	51.2
Solar panels	40.8	59.5	94.7	54.3	32.1	35.7	47.7	47.6	47.3	64.3	87.8	11.5
Other generation technology	71.1	57.6	39.8	29.4	33.1	46.4	28.3	31.5	63.5	22.4	36.0	9.4
<b>Food preparation or serving areas in non-food service buildings (more than one may apply)</b>												
Snack bar, concession stand, or coffee shop	31.2	18.1	27.2	34.3	16.3	22.9	19.8	30.5	28.8	15.4	22.1	36.0
Fast food or small restaurant	42.7	40.5	62.3	77.9	18.3	14.8	19.5	35.1	36.3	35.6	56.4	87.6
Cafeteria or large restaurant	39.0	18.4	34.6	35.9	15.0	17.3	12.8	30.6	36.2	21.9	28.8	31.7
Commercial kitchen or food preparation area	34.3	15.9	32.7	72.6	13.8	16.9	11.8	26.9	28.9	15.7	31.8	73.9
Small kitchen area	24.5	22.3	33.2	53.0	16.0	20.4	12.8	28.9	19.1	24.4	32.3	55.7

Relative standard errors (RSEs) for Table C35. Fuel oil consumption and conditional energy intensity by census region, 2018

	RSEs for total fuel oil consumption				RSEs for total floorspace of buildings using fuel oil				RSEs for fuel oil energy intensity			
	North-east	Mid-west	South	West	North-east	Mid-west	South	West	North-east	Mid-west	South	West
<b>All buildings</b>	23.1	14.8	16.8	61.0	10.3	10.3	7.9	17.2	17.7	13.2	18.9	61.2
<b>Annual consumption (gallons)</b>												
1,000 or less	16.3	39.0	20.4	42.2	11.1	13.0	8.9	14.6	14.4	33.2	16.0	42.3
1,001 to 5,000	27.6	43.1	44.3	65.6	15.0	19.6	16.9	40.6	18.4	34.2	41.1	78.3
5,001 to 10,000	38.5	41.5	41.6	91.7	30.6	59.4	23.6	64.7	34.6	92.3	33.6	172.1
10,001 to 25,000	35.6	41.1	55.1	77.4	35.4	33.4	41.8	64.5	18.7	16.9	56.6	72.5
Over 25,000	42.5	27.3	29.6	55.8	27.7	23.8	40.3	55.6	25.4	13.4	69.5	47.5

Data source: U.S. Energy Information Administration, Forms EIA-871A and F of the 2018 Commercial Buildings Energy Consumption Survey

Note: RSE is a measure of the reliability or precision of a survey statistic. Variability occurs in survey statistics because the different samples that could be drawn would each produce different values for the survey statistics. *Estimation of Standard Errors* and *What is a Relative Standard Error (RSE)?* contain more information on how RSEs are estimated and used. Both references can be accessed from <https://www.eia.gov/consumption/commercial/survey-background-technical-information.php>.

<sup>a</sup>Climate zones are based on ASHRAE Standard 169-2021; see <https://www.eia.gov/consumption/commercial/maps.php#defined>.

<sup>b</sup>Other sources includes wood, coal, solar, and all other energy sources.