

Preliminary release date: September 2022

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Table C23. Total natural gas consumption and expenditures, 2018

	All buildings using natural gas		Natural gas consumption		Natural gas expenditures	
	Number of buildings (thousand)	Total floorspace (million square feet)	Mean floorspace per building (thousand square feet)	Total (trillion British thermal units [Btu])	Total (billion cubic feet)	Total (million dollars)
All buildings	2,974	67,722	22.8	2,300	2,216	\$16,292
Building floorspace (square feet)						
1,001 to 5,000	1,123	3,292	2.9	183	176	\$1,712
5,001 to 10,000	679	5,200	7.7	209	201	\$1,735
10,001 to 25,000	595	9,523	16.0	320	308	\$2,619
25,001 to 50,000	291	10,467	36.0	365	352	\$2,621
50,001 to 100,000	171	11,988	70.3	385	371	\$2,588
100,001 to 200,000	75	10,516	139.9	321	309	\$2,016
200,001 to 500,000	33	9,674	292.9	320	308	\$1,926
Over 500,000	7	7,062	972.1	197	190	\$1,073
Principal building activity						
Education	216	10,254	47.4	328	316	\$2,154
Food sales	90	662	7.4	48	46	\$331
Food service	203	987	4.9	151	146	\$1,139
Health care	77	3,370	43.6	207	199	\$1,304
Inpatient	7	2,105	305.9	170	164	\$1,020
Outpatient	70	1,265	18.0	36	35	\$284
Lodging	138	5,842	42.3	224	216	\$1,454
Mercantile	328	8,992	27.4	334	321	\$2,194
Retail (other than mall)	172	3,585	20.8	87	83	\$629
Enclosed and strip malls	156	5,407	34.7	247	238	\$1,565
Office	549	11,283	20.5	250	241	\$2,027
Public assembly	275	5,233	19.1	216	208	\$1,474
Public order and safety	54	1,271	23.4	47	45	\$329
Religious worship	259	4,083	15.8	94	91	\$788
Service	382	3,343	8.8	145	140	\$1,200
Warehouse and storage	320	10,309	32.2	199	192	\$1,460
Other	53	1,596	30.1	48	47	\$362
Vacant	30	497	16.5	10	10	\$76
Year constructed						
Before 1920	184	2,459	13.4	81	79	\$635
1920 to 1945	172	3,859	22.4	124	119	\$864
1946 to 1959	310	5,019	16.2	173	166	\$1,298
1960 to 1969	420	7,811	18.6	289	278	\$2,068
1970 to 1979	400	9,088	22.7	303	292	\$2,106
1980 to 1989	372	8,770	23.6	312	301	\$2,234
1990 to 1999	412	10,386	25.2	312	300	\$2,217
2000 to 2009	454	12,833	28.3	476	458	\$3,314
2010 to 2018	250	7,498	30.0	232	223	\$1,555

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	All buildings using natural gas		Natural gas consumption		Natural gas expenditures	
	Number of buildings (thousand)	Total floorspace (million square feet)	Mean floorspace per building (thousand square feet)	Total (trillion British thermal units [Btu])	Total (billion cubic feet)	Total (million dollars)
All buildings	2,974	67,722	22.8	2,300	2,216	\$16,292
Census region and division						
Northeast	373	11,331	30.4	425	409	\$3,129
New England	65	1,861	28.7	78	75	\$637
Middle Atlantic	308	9,470	30.7	346	334	\$2,492
Midwest	982	20,410	20.8	816	786	\$5,294
East North Central	712	14,491	20.4	603	580	\$3,823
West North Central	270	5,919	21.9	214	206	\$1,471
South	894	21,895	24.5	616	593	\$4,818
South Atlantic	361	10,285	28.5	295	285	\$2,237
East South Central	200	4,122	20.6	126	122	\$1,083
West South Central	333	7,488	22.5	194	187	\$1,499
West	725	14,086	19.4	444	428	\$3,050
Mountain	292	5,948	20.4	232	223	\$1,411
Pacific	433	8,138	18.8	212	204	\$1,639
Climate zone^a						
Cold or very cold	249	4,971	20.0	208	200	\$1,396
Cool	972	20,476	21.1	821	791	\$5,427
Mixed mild	634	18,756	29.6	654	630	\$4,588
Warm	869	17,686	20.4	479	461	\$3,803
Hot or very hot	251	5,833	23.2	138	133	\$1,077
Number of floors						
1	1,850	27,344	14.8	1,012	975	\$7,513
2	761	17,201	22.6	529	510	\$3,858
3	248	8,169	32.9	270	260	\$1,902
4 to 9	104	10,438	100.8	353	340	\$2,208
10 or more	11	4,570	399.1	136	131	\$810
Number of workers (main shift)						
Fewer than 5	1,264	9,828	7.8	296	285	\$2,560
5 to 9	635	6,877	10.8	223	215	\$1,814
10 to 19	470	7,981	17.0	312	301	\$2,377
20 to 49	365	12,607	34.5	438	422	\$3,098
50 to 99	138	10,039	72.6	349	336	\$2,318
100 to 249	75	10,867	145.6	367	354	\$2,235
250 or more	27	9,523	357.6	316	304	\$1,889
Weekly operating hours						
Fewer than 40	551	6,020	10.9	162	156	\$1,342
40 to 48	756	12,381	16.4	327	315	\$2,537
49 to 60	681	16,045	23.6	440	424	\$3,256
61 to 84	396	11,214	28.3	411	396	\$2,849
85 to 167	255	7,378	29.0	339	326	\$2,296
Open continuously	335	14,684	43.8	620	598	\$4,011

Table C23. Total natural gas consumption and expenditures, 2018

	All buildings using natural gas		Natural gas consumption		Natural gas expenditures	
	Number of buildings (thousand)	Total floorspace (million square feet)	Mean floorspace per building (thousand square feet)	Total (trillion British thermal units [Btu])	Total (billion cubic feet)	Total (million dollars)
All buildings	2,974	67,722	22.8	2,300	2,216	\$16,292
Ownership and occupancy						
Nongovernment owned	2,502	51,735	20.7	1,784	1,719	\$12,816
Owner occupied	1,637	31,586	19.3	1,089	1,049	\$7,896
Leased to tenant or tenants	844	19,934	23.6	691	666	\$4,882
Unoccupied	Q	Q	Q	Q	Q	Q
Government owned	471	15,987	33.9	516	497	\$3,476
Federal	20	1,323	65.9	39	37	\$239
State	139	4,940	35.5	161	155	\$1,048
Local	312	9,725	31.2	317	305	\$2,190
Party responsible for operation of energy systems						
Building owner	2,388	55,421	23.2	1,856	1,788	\$13,101
Business owner or tenant	495	9,227	18.6	353	340	\$2,556
Property management	39	1,452	36.9	40	38	\$286
Other	51	1,622	31.5	52	50	\$348
Provider of direct input on energy-related equipment purchases						
Building owner	2,565	58,008	22.6	1,948	1,877	\$13,803
Business owner or tenant	259	5,543	21.4	224	216	\$1,578
Property management	24	821	34.8	24	23	\$171
Other	126	3,350	26.6	104	100	\$739
Number of establishments						
1	2,313	44,539	19.3	1,524	1,468	\$11,085
2 to 5	472	12,237	25.9	420	404	\$2,903
6 to 10	103	4,470	43.4	155	149	\$1,053
11 to 20	47	3,110	65.8	116	112	\$746
More than 20	13	3,059	238.5	79	76	\$452
Currently unoccupied	26	307	12.0	7	6	\$53
Predominant exterior wall material						
Brick, stone, or stucco	1,534	34,948	22.8	1,291	1,244	\$9,083
Concrete (block or poured)	513	14,219	27.7	480	462	\$3,301
Concrete panels	103	6,519	63.1	174	167	\$1,166
Siding or shingles	333	2,716	8.2	105	101	\$858
Metal panels	407	6,136	15.1	170	164	\$1,309
Window glass	12	1,670	135.9	41	40	\$298
Other	71	1,514	21.3	40	38	\$277

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All buildings	2,974	67,722	22.8	2,300	2,216	\$16,292
Predominant roof material						
Metal surfacing	773	10,457	13.5	315	303	\$2,460
Synthetic or rubber	665	25,457	38.3	916	882	\$6,156
Built-up	456	15,391	33.7	511	493	\$3,450
Slate or tile shingles	222	2,633	11.9	98	94	\$769
Wooden materials (including shingles)	79	858	10.9	36	34	\$313
Asphalt, fiberglass, or other shingles	685	9,536	13.9	330	318	\$2,492
Concrete	27	1,239	46.0	36	34	\$244
Other	67	2,151	32.1	59	57	\$409
Roof tilt						
Flat	1,180	41,211	34.9	1,468	1,414	\$9,846
Shallow pitch	1,055	17,830	16.9	547	527	\$4,147
Steeper pitch	738	8,681	11.8	286	275	\$2,298
Cool roof characteristics (more than one may apply)						
White or reflective coating or paint	692	24,395	35.2	829	798	\$5,636
White or reflective tiles or shingles	60	1,990	33.0	62	60	\$455
Aluminum coating	213	3,288	15.5	107	103	\$789
Ballasted roof system	89	5,296	59.6	202	195	\$1,244
Other cool roof property	28	1,364	49.5	32	31	\$208
Renovations since 2000 (more than one may apply)						
Any type of renovation	1,138	33,747	29.7	1,204	1,160	\$8,314
Addition or annex	169	8,608	51.1	364	351	\$2,371
Reduction in floorspace	20	1,324	66.3	46	44	\$276
Roof replacement	452	15,384	34.0	573	552	\$3,789
Interior wall reconfiguration	393	15,984	40.6	550	529	\$3,634
Window replacement	291	8,548	29.4	316	305	\$2,124
HVAC equipment upgrade	606	21,265	35.1	754	726	\$5,059
Lighting upgrade	627	22,812	36.4	800	771	\$5,379
Electrical upgrade	327	12,419	38.0	472	455	\$3,107
Plumbing system upgrade	328	11,858	36.1	443	427	\$2,917
Insulation upgrade	173	6,156	35.7	239	230	\$1,522
Fire, safety, or security upgrade	341	15,629	45.9	583	562	\$3,756
Structural upgrade	87	3,389	39.0	144	139	\$897
Other	26	966	36.7	32	31	\$221
No renovations	1,664	28,648	17.2	932	898	\$6,892
Buildings constructed 2013 or later	171	5,326	31.1	164	158	\$1,085

Table C23. Total natural gas consumption and expenditures, 2018

	All buildings using natural gas		Natural gas consumption		Natural gas expenditures	
	Number of buildings (thousand)	Total floorspace (million square feet)	Mean floorspace per building (thousand square feet)	Total (trillion British thermal units [Btu])	Total (billion cubic feet)	Total (million dollars)
All buildings	2,974	67,722	22.8	2,300	2,216	\$16,292
Energy sources (more than one may apply)						
Electricity	2,974	67,722	22.8	2,300	2,216	\$16,292
Natural gas	2,974	67,722	22.8	2,300	2,216	\$16,292
Fuel oil	217	14,958	68.8	541	522	\$3,492
District heat	38	4,333	113.2	91	88	\$575
District chilled water	31	2,925	94.1	64	62	\$384
Propane	106	4,568	43.0	155	149	\$960
Solar	68	3,321	48.9	97	93	\$627
Wood, coal, and other	76	1,282	16.8	56	54	\$358
Space-heating energy sources						
Natural gas	2,587	58,042	22.4	2,086	2,010	\$14,643
Natural gas main	2,344	50,060	21.4	1,903	1,833	\$13,301
Natural gas secondary	243	7,982	32.8	184	177	\$1,342
Other excluding natural gas	346	9,068	26.2	200	193	\$1,520
Buildings without heating	40	611	15.1	14	13	\$129
Primary space-heating energy source						
Electricity	530	12,849	24.2	306	295	\$2,357
Natural gas	2,344	50,060	21.4	1,903	1,833	\$13,301
Fuel oil	22	360	16.3	Q	Q	Q
District heat	34	3,792	112.0	71	68	\$452
Propane	Q	Q	Q	Q	Q	Q
Other sources ^b	Q	Q	Q	Q	Q	Q
Cooling energy sources						
Natural gas	4	400	90.9	22	22	\$127
Other excluding natural gas	2,724	64,801	23.8	2,201	2,120	\$15,569
Buildings without cooling	245	2,522	10.3	77	74	\$596
Water-heating energy sources						
Natural gas	1,885	46,652	24.8	1,773	1,708	\$12,111
Other excluding natural gas	901	19,553	21.7	495	477	\$3,904
Buildings without water heating	188	1,517	8.1	32	31	\$276
Cooking energy sources						
Natural gas	727	27,705	38.1	1,234	1,189	\$8,040
Other excluding natural gas	441	8,461	19.2	250	241	\$1,848
Buildings without cooking	1,806	31,555	17.5	817	787	\$6,404
Energy end uses (more than one may apply)						
Buildings with space heating	2,933	67,111	22.9	2,287	2,203	\$16,163
Buildings with cooling	2,728	65,200	23.9	2,223	2,142	\$15,696
Buildings with water heating	2,786	66,205	23.8	2,268	2,185	\$16,015
Buildings with cooking	1,168	36,167	31.0	1,484	1,430	\$9,887
Buildings with manufacturing	187	5,261	28.1	174	167	\$1,199
Buildings with electricity generation	462	23,977	52.0	895	862	\$5,761
Buildings with lighting	2,952	67,507	22.9	2,294	2,210	\$16,244

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All buildings	2,974	67,722	22.8	2,300	2,216	\$16,292
Percentage of floorspace heated						
Not heated	40	611	15.1	14	13	\$129
1% to 50%	318	6,269	19.7	114	110	\$916
51% to 99%	612	16,463	26.9	537	517	\$3,734
100%	2,003	44,379	22.2	1,635	1,576	\$11,513
Percentage of floorspace cooled						
Not cooled	245	2,522	10.3	77	74	\$596
1% to 50%	610	13,357	21.9	357	344	\$2,659
51% to 99%	673	21,201	31.5	735	708	\$5,014
100%	1,445	30,642	21.2	1,131	1,090	\$8,023
Heating equipment (more than one may apply)						
Packaged heating units	1,480	38,814	26.2	1,353	1,304	\$9,339
Furnaces	1,060	13,844	13.1	521	502	\$3,825
Individual space heaters	733	16,330	22.3	586	564	\$4,047
Boilers	532	25,679	48.3	1,052	1,013	\$6,864
Heat pumps	295	11,031	37.4	374	360	\$2,471
District heat	38	4,174	110.8	84	81	\$536
Duct reheat	72	5,121	71.4	170	164	\$1,069
Other	7	632	87.6	36	35	\$203
Cooling equipment (more than one may apply)						
Packaged air-conditioning units	1,691	44,330	26.2	1,568	1,510	\$11,003
Residential-type central air conditioners	807	14,076	17.4	523	504	\$3,785
Individual air conditioners	404	10,383	25.7	402	387	\$2,724
Central chillers	150	14,891	99.3	557	536	\$3,542
Heat pumps	210	7,909	37.7	260	251	\$1,704
District chilled water	31	2,925	94.1	64	62	\$384
Swamp coolers	52	1,607	31.0	66	64	\$439
Other	Q	Q	Q	Q	Q	Q
HVAC features (more than one may apply)						
Economizer cycle	528	27,877	52.7	1,026	989	\$6,635
Variable air volume (VAV) system	465	23,030	49.6	786	758	\$5,115
Dedicated outside air system (DOAS)	165	7,285	44.2	287	277	\$1,797
Demand controlled ventilation (DCV)	229	8,510	37.2	293	282	\$1,937
Regular HVAC maintenance	2,109	58,891	27.9	2,038	1,964	\$14,123
Building automation system (BAS) controls heating or cooling	619	32,089	51.9	1,123	1,082	\$7,208
Internet-connected or smart thermostat	190	4,467	23.5	123	118	\$914
Programmable thermostat	936	15,048	16.1	521	502	\$4,006
Main equipment replaced since 2000 (more than one may apply)						
Heating	1,153	24,892	21.6	857	825	\$6,130
Cooling	697	16,833	24.2	621	599	\$4,363

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	Number of buildings (thousand)	Total floorspace (million square feet)	Mean floorspace per building (thousand square feet)	Total (trillion British thermal units [Btu])	Total (billion cubic feet)	Total (million dollars)
All buildings	2,974	67,722	22.8	2,300	2,216	\$16,292
Water-heating equipment						
Centralized system	2,164	44,388	20.5	1,558	1,501	\$11,234
Distributed system	425	10,158	23.9	335	323	\$2,354
Combination of centralized and distributed systems	197	11,660	59.3	375	361	\$2,427
Generation technologies (more than one may apply)						
Reciprocating engine generators	377	20,463	54.3	778	750	\$5,013
Solar panels	67	3,286	48.8	95	92	\$616
Other generation technology	23	1,603	70.4	66	64	\$386
Food preparation or serving areas in non-food service buildings (more than one may apply)						
Snack bar, concession stand, or coffee shop	104	9,183	88.2	375	361	\$2,227
Fast food or small restaurant	120	8,725	72.8	367	354	\$2,178
Cafeteria or large restaurant	103	12,499	121.8	482	464	\$2,899
Commercial kitchen or food preparation area	234	16,013	68.5	665	641	\$4,186
Small kitchen area	625	16,505	26.4	574	553	\$3,831
Annual consumption (hundred cubic feet)						
1,000 or less	928	6,009	6.5	50	48	\$604
1,001 to 5,000	1,167	12,678	10.9	299	288	\$2,665
5,001 to 10,000	412	10,154	24.7	305	294	\$2,401
10,001 to 25,000	304	13,935	45.9	475	457	\$3,674
25,001 to 50,000	100	9,498	95.2	367	354	\$2,253
50,001 to 100,000	43	6,835	159.5	309	297	\$1,811
Over 100,000	21	8,614	412.5	496	478	\$2,883

Data source: U.S. Energy Information Administration, Forms EIA-871A and C 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 and expenditures in buildings that have the end use but not the consumption and expenditures specifically for that end use.

HVAC = Heating, ventilation, and air conditioning.

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

^bOther 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.

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Relative standard errors (RSEs) for Table C23. Total natural gas consumption and expenditures, 2018

	RSEs for all buildings using natural gas			RSEs for natural gas consumption		RSEs for natural gas expenditures
	Number of buildings	Total floorspace	Mean floorspace per building	Total	Total	Total
All buildings	4.8	3.4	3.2	3.7	3.7	3.5
Building floorspace (square feet)						
1,001 to 5,000	7.7	8.1	2.7	8.4	8.4	8.9
5,001 to 10,000	8.1	8.2	1.5	9.3	9.3	8.8
10,001 to 25,000	6.7	7.2	1.6	8.0	8.0	8.0
25,001 to 50,000	6.5	6.6	1.2	6.7	6.7	6.4
50,001 to 100,000	5.6	5.6	1.1	6.9	6.9	7.0
100,001 to 200,000	6.3	6.2	1.0	7.0	7.0	7.3
200,001 to 500,000	5.6	5.5	1.1	6.1	6.1	6.8
Over 500,000	8.3	9.2	4.5	15.2	15.2	12.1
Principal building activity						
Education	10.9	6.6	8.7	6.9	6.9	7.6
Food sales	19.6	17.1	16.1	19.1	19.1	20.3
Food service	8.9	10.4	7.3	10.6	10.6	10.1
Health care	14.3	6.3	12.4	6.6	6.6	7.0
Inpatient	14.9	7.5	14.0	7.2	7.2	8.3
Outpatient	15.3	10.3	11.8	11.3	11.3	10.9
Lodging	11.9	8.7	12.4	12.5	12.5	9.3
Mercantile	8.7	6.3	7.3	8.1	8.1	7.5
Retail (other than mall)	14.1	10.9	9.9	13.0	13.0	12.1
Enclosed and strip malls	8.7	7.7	9.2	9.9	9.9	9.0
Office	8.0	6.3	7.8	7.2	7.2	7.7
Public assembly	10.6	6.9	7.9	8.5	8.5	8.1
Public order and safety	22.0	16.9	21.5	20.8	20.8	18.8
Religious worship	12.1	11.7	7.1	12.9	12.9	13.0
Service	9.8	10.5	7.0	13.7	13.7	13.5
Warehouse and storage	9.3	8.6	9.0	10.2	10.2	9.6
Other	28.2	19.3	26.6	22.7	22.7	22.5
Vacant	25.8	19.7	26.0	24.5	24.5	22.3
Year constructed						
Before 1920	15.2	12.7	14.2	13.1	13.1	12.6
1920 to 1945	12.8	11.1	12.3	10.2	10.2	10.4
1946 to 1959	11.3	9.4	9.4	9.6	9.6	10.0
1960 to 1969	7.5	6.2	6.3	6.9	6.9	6.6
1970 to 1979	9.4	6.5	7.1	7.4	7.4	7.5
1980 to 1989	7.6	6.9	7.4	11.2	11.2	8.3
1990 to 1999	9.4	7.0	6.9	7.4	7.4	7.6
2000 to 2009	9.1	6.4	6.4	6.8	6.8	7.1
2010 to 2018	11.3	9.0	10.1	8.5	8.5	8.6

Relative standard errors (RSEs) for Table C23. Total natural gas consumption and expenditures, 2018

	RSEs for all buildings using natural gas			RSEs for natural gas consumption		RSEs for natural gas expenditures	
	Number of buildings	Total floorspace	Mean floorspace per building	Total	Total	Total	
All buildings	4.8	3.4	3.2	3.7	3.7	3.5	
Census region and division							
Northeast	10.5	8.2	8.3	6.5	6.5	7.2	
New England	16.1	11.8	16.2	12.6	12.6	9.3	
Middle Atlantic	12.1	9.6	9.3	7.4	7.4	8.7	
Midwest	12.0	7.5	7.6	7.6	7.6	8.2	
East North Central	13.3	9.3	8.5	9.7	9.7	10.5	
West North Central	28.5	13.6	21.1	11.8	11.8	13.5	
South	7.1	6.3	3.6	6.4	6.4	6.6	
South Atlantic	8.8	7.1	6.7	6.9	6.9	7.1	
East South Central	22.3	22.3	3.9	20.1	20.1	21.3	
West South Central	9.1	8.6	5.9	11.4	11.4	9.7	
West	11.6	8.6	7.0	12.3	12.3	10.3	
Mountain	18.5	16.2	10.7	21.0	21.0	17.9	
Pacific	15.2	8.9	9.0	11.9	11.9	11.7	
Climate zone^a							
Cold or very cold	27.9	23.3	13.1	21.8	21.8	21.4	
Cool	12.0	8.9	7.5	9.0	9.0	9.2	
Mixed mild	16.0	10.8	9.1	12.0	12.0	11.4	
Warm	12.2	11.1	4.9	11.5	11.5	11.7	
Hot or very hot	21.4	13.3	13.7	13.5	13.5	13.9	
Number of floors							
1	5.4	4.9	3.5	4.9	4.9	4.8	
2	7.2	5.4	4.8	6.9	6.9	6.6	
3	11.9	7.7	8.3	8.1	8.1	8.2	
4 to 9	10.0	6.4	7.8	6.7	6.7	6.7	
10 or more	11.7	12.9	9.5	19.9	19.9	15.7	
Number of workers (main shift)							
Fewer than 5	7.5	8.1	5.8	7.9	7.9	7.9	
5 to 9	8.2	9.0	5.2	9.4	9.4	9.2	
10 to 19	7.2	8.6	6.1	8.3	8.3	8.0	
20 to 49	8.1	5.6	5.5	5.9	5.9	6.1	
50 to 99	7.0	6.4	4.0	7.6	7.6	7.9	
100 to 249	7.9	6.1	4.6	7.3	7.3	7.2	
250 or more	7.5	6.9	6.3	10.1	10.1	9.0	
Weekly operating hours							
Fewer than 40	9.7	9.5	7.3	10.0	10.0	10.5	
40 to 48	8.1	5.8	5.7	7.0	7.0	6.6	
49 to 60	6.8	5.2	5.1	7.1	7.1	6.9	
61 to 84	8.9	5.3	7.3	6.4	6.4	6.5	
85 to 167	8.7	6.5	8.3	7.9	7.9	7.8	
Open continuously	9.1	5.6	8.3	6.2	6.2	5.1	

Relative standard errors (RSEs) for Table C23. Total natural gas consumption and expenditures, 2018

	RSEs for all buildings using natural gas			RSEs for natural gas consumption		RSEs for natural gas expenditures
	Number of buildings	Total floorspace	Mean floorspace per building	Total	Total	Total
All buildings	4.8	3.4	3.2	3.7	3.7	3.5
Ownership and occupancy						
Nongovernment owned	4.8	3.9	3.7	4.0	4.0	3.7
Owner occupied	5.4	4.2	4.4	4.7	4.7	4.3
Leased to tenant or tenants	6.7	5.1	5.2	5.6	5.6	5.2
Unoccupied	33.0	36.0	36.9	42.4	42.4	35.7
Government owned	10.7	5.8	7.6	6.0	6.0	6.4
Federal	25.6	18.5	21.8	20.1	20.1	20.0
State	16.5	11.0	12.0	12.0	12.0	11.9
Local	11.5	7.0	9.7	7.2	7.2	7.7
Party responsible for operation of energy systems						
Building owner	5.6	3.6	3.9	4.1	4.1	4.0
Business owner or tenant	8.8	7.9	6.3	8.6	8.6	8.2
Property management	21.6	14.0	17.0	16.7	16.7	16.3
Other	19.8	13.5	16.0	14.9	14.9	14.1
Provider of direct input on energy-related equipment purchases						
Building owner	5.5	3.7	3.6	4.1	4.1	4.0
Business owner or tenant	10.2	9.1	7.9	8.8	8.8	8.6
Property management	36.7	18.5	42.2	23.9	23.9	22.9
Other	12.3	9.1	10.4	11.4	11.4	10.5
Number of establishments						
1	5.5	3.9	3.7	4.1	4.1	4.1
2 to 5	8.0	6.9	6.4	9.1	9.1	7.6
6 to 10	12.2	8.7	9.1	9.9	9.9	9.4
11 to 20	21.8	9.7	18.2	13.2	13.2	14.3
More than 20	15.8	10.0	14.9	15.9	15.9	14.8
Currently unoccupied	30.0	26.8	32.1	33.1	33.1	28.8
Predominant exterior wall material						
Brick, stone, or stucco	5.7	4.3	3.8	4.6	4.6	4.4
Concrete (block or poured)	7.4	5.8	5.9	6.4	6.4	6.2
Concrete panels	15.0	9.4	13.1	12.7	12.7	13.2
Siding or shingles	13.2	12.6	9.9	10.8	10.8	11.1
Metal panels	11.4	8.7	8.0	10.1	10.1	9.1
Window glass	22.3	13.9	18.0	17.1	17.1	17.4
Other	18.6	16.5	15.5	18.1	18.1	17.7
Predominant roof material						
Metal surfacing	8.2	6.6	5.1	7.7	7.7	7.7
Synthetic or rubber	7.2	4.0	5.7	4.4	4.4	4.8
Built-up	8.7	5.5	7.1	8.1	8.1	7.0
Slate or tile shingles	12.2	11.0	10.6	14.5	14.5	13.7
Wooden materials (including shingles)	20.1	23.0	16.1	19.3	19.3	20.4
Asphalt, fiberglass, or other shingles	8.3	6.6	6.0	7.3	7.3	7.3
Concrete	25.8	15.8	19.8	16.5	16.5	17.5
Other	19.2	9.3	16.2	12.2	12.2	13.2

Relative standard errors (RSEs) for Table C23. Total natural gas consumption and expenditures, 2018

	RSEs for all buildings using natural gas			RSEs for natural gas consumption		RSEs for natural gas expenditures
	Number of buildings	Total floorspace	Mean floorspace per building	Total	Total	Total
All buildings	4.8	3.4	3.2	3.7	3.7	3.5
Roof tilt						
Flat	5.3	3.5	4.5	4.4	4.4	4.2
Shallow pitch	7.1	5.9	4.7	5.7	5.7	5.8
Steeper pitch	8.5	6.5	5.0	7.1	7.1	7.0
Cool roof characteristics (more than one may apply)						
White or reflective coating or paint	7.0	4.7	5.9	6.2	6.2	5.3
White or reflective tiles or shingles	14.6	11.0	13.3	13.5	13.5	13.8
Aluminum coating	12.6	11.3	10.7	12.6	12.6	11.3
Ballasted roof system	17.5	9.7	16.3	14.7	14.7	12.4
Other cool roof property	32.9	21.3	33.3	21.2	21.2	20.9
Renovations since 2000 (more than one may apply)						
Any type of renovation	6.0	3.9	4.3	4.4	4.4	4.2
Addition or annex	10.7	6.1	8.4	7.3	7.3	7.9
Reduction in floorspace	26.6	16.0	26.7	19.6	19.6	18.3
Roof replacement	7.5	4.8	6.0	6.2	6.2	5.7
Interior wall reconfiguration	9.1	5.1	7.4	7.7	7.7	6.9
Window replacement	11.0	6.4	9.6	9.1	9.1	7.6
HVAC equipment upgrade	7.8	4.7	5.8	5.3	5.3	5.1
Lighting upgrade	7.4	4.3	5.6	5.5	5.5	5.2
Electrical upgrade	10.5	6.7	8.5	7.7	7.7	7.0
Plumbing system upgrade	9.9	6.1	8.6	7.5	7.5	6.9
Insulation upgrade	13.5	9.4	12.5	12.1	12.1	10.5
Fire, safety, or security upgrade	8.0	5.1	6.6	6.8	6.8	6.2
Structural upgrade	18.4	12.5	18.0	17.7	17.7	14.2
Other	30.4	15.8	25.4	19.3	19.3	19.6
No renovations	5.2	4.3	4.0	4.7	4.7	4.6
Buildings constructed 2013 or later	12.7	9.9	11.8	9.9	9.9	9.7
Energy sources (more than one may apply)						
Electricity	4.8	3.4	3.2	3.7	3.7	3.5
Natural gas	4.8	3.4	3.2	3.7	3.7	3.5
Fuel oil	13.1	6.2	12.0	7.5	7.5	6.6
District heat	18.5	12.0	15.8	11.8	11.8	11.9
District chilled water	23.3	13.4	18.5	19.1	19.1	16.9
Propane	16.7	11.4	15.5	17.4	17.4	14.0
Solar	18.0	12.1	16.3	13.4	13.4	13.4
Wood, coal, and other	25.5	18.6	21.1	19.3	19.3	18.3
Space-heating energy sources						
Natural gas	5.2	3.6	3.5	4.0	4.0	3.8
Natural gas main	5.5	4.1	3.7	4.3	4.3	4.1
Natural gas secondary	9.9	6.6	9.4	7.8	7.8	8.1
Other excluding natural gas	8.7	6.3	8.0	7.3	7.3	7.6
Buildings without heating	29.2	25.0	28.7	27.8	27.8	27.1

Relative standard errors (RSEs) for Table C23. Total natural gas consumption and expenditures, 2018

	RSEs for all buildings using natural gas			RSEs for natural gas consumption		RSEs for natural gas expenditures	
	Number of buildings	Total floorspace	Mean floorspace per building	Total	Total	Total	
All buildings	4.8	3.4	3.2	3.7	3.7	3.5	
Primary space-heating energy source							
Electricity	7.5	5.8	6.6	6.5	6.5	6.7	
Natural gas	5.5	4.1	3.7	4.3	4.3	4.1	
Fuel oil	46.0	34.0	35.0	50.0	50.0	59.3	
District heat	19.8	13.7	18.4	12.5	12.5	13.2	
Propane	48.1	48.1	0.0	48.1	48.1	48.1	
Other sources ^b	69.9	43.2	38.1	40.5	40.5	39.4	
Cooling energy sources							
Natural gas	37.3	24.2	46.6	27.0	27.0	25.9	
Other excluding natural gas	4.5	3.3	3.2	3.6	3.6	3.4	
Buildings without cooling	17.3	13.9	12.6	15.7	15.7	14.6	
Water-heating energy sources							
Natural gas	5.5	3.7	3.8	4.3	4.3	4.0	
Other excluding natural gas	7.2	4.9	5.5	6.0	6.0	6.0	
Buildings without water heating	16.6	15.3	14.4	18.2	18.2	16.8	
Cooking energy sources							
Natural gas	5.4	3.4	4.8	4.1	4.1	3.8	
Other excluding natural gas	8.6	6.3	6.8	7.9	7.9	7.8	
Buildings without cooking	5.7	4.7	4.0	5.4	5.4	5.1	
Energy end uses (more than one may apply)							
Buildings with space heating	4.9	3.4	3.3	3.7	3.7	3.6	
Buildings with cooling	4.5	3.3	3.1	3.6	3.6	3.4	
Buildings with water heating	4.8	3.3	3.1	3.7	3.7	3.5	
Buildings with cooking	5.2	3.3	4.1	4.1	4.1	3.8	
Buildings with manufacturing	13.6	9.2	11.4	10.4	10.4	10.4	
Buildings with electricity generation	7.8	4.5	6.9	5.3	5.3	4.8	
Buildings with lighting	4.8	3.3	3.3	3.7	3.7	3.5	
Percentage of floorspace heated							
Not heated	29.2	25.0	28.7	27.8	27.8	27.1	
1% to 50%	10.9	8.7	8.7	10.0	10.0	11.7	
51% to 99%	7.5	5.6	6.0	6.0	6.0	5.7	
100%	5.4	3.7	3.6	4.6	4.6	4.3	
Percentage of floorspace cooled							
Not cooled	17.3	13.9	12.6	15.7	15.7	14.6	
1% to 50%	8.5	6.4	6.5	7.6	7.6	7.5	
51% to 99%	7.4	5.2	5.6	5.8	5.8	6.0	
100%	4.7	3.8	3.9	4.7	4.7	4.1	

Relative standard errors (RSEs) for Table C23. Total natural gas consumption and expenditures, 2018

	RSEs for all buildings using natural gas			RSEs for natural gas consumption		RSEs for natural gas expenditures	
	Number of buildings	Total floorspace	Mean floorspace per building	Total	Total	Total	
All buildings	4.8	3.4	3.2	3.7	3.7	3.5	
Heating equipment (more than one may apply)							
Packaged heating units	4.7	4.0	3.4	4.5	4.5	4.0	
Furnaces	8.4	6.4	6.2	6.1	6.1	6.1	
Individual space heaters	8.2	5.5	5.6	7.5	7.5	7.0	
Boilers	7.2	4.3	6.2	5.0	5.0	4.8	
Heat pumps	7.0	5.6	7.7	8.8	8.8	6.6	
District heat	19.2	12.3	16.3	11.8	11.8	12.4	
Duct reheat	13.6	7.1	12.5	8.6	8.6	9.5	
Other	27.9	21.5	26.3	23.5	23.5	23.6	
Cooling equipment (more than one may apply)							
Packaged air-conditioning units	4.5	3.7	3.4	3.6	3.6	3.6	
Residential-type central air conditioners	8.8	5.7	5.9	5.6	5.6	5.8	
Individual air conditioners	9.2	6.0	7.3	6.7	6.7	6.7	
Central chillers	7.7	5.0	6.9	4.7	4.7	5.1	
Heat pumps	11.2	7.5	10.5	11.6	11.6	9.3	
District chilled water	23.3	13.4	18.5	19.1	19.1	16.9	
Swamp coolers	19.8	15.4	13.1	17.0	17.0	18.1	
Other	81.2	46.9	202.4	50.3	50.3	52.3	
HVAC features (more than one may apply)							
Economizer cycle	6.9	4.3	5.9	4.9	4.9	4.6	
Variable air volume (VAV) system	8.7	4.8	8.0	5.9	5.9	5.5	
Dedicated outside air system (DOAS)	11.7	8.7	10.9	11.4	11.4	9.4	
Demand controlled ventilation (DCV)	10.8	6.6	8.9	6.4	6.4	6.4	
Regular HVAC maintenance	5.1	3.6	3.4	3.9	3.9	3.8	
Building automation system (BAS) controls heating or cooling	7.0	3.6	5.9	4.6	4.6	4.2	
Internet-connected or smart thermostat	12.3	11.7	10.6	12.9	12.9	12.5	
Programmable thermostat	6.7	6.9	4.6	7.2	7.2	7.1	
Main equipment replaced since 2000 (more than one may apply)							
Heating	6.0	4.3	4.4	4.7	4.7	4.9	
Cooling	7.0	5.5	6.1	6.6	6.6	6.2	
Water-heating equipment							
Centralized system	5.5	4.0	3.5	4.6	4.6	4.3	
Distributed system	9.4	6.3	8.0	7.3	7.3	6.7	
Combination of centralized and distributed systems	11.7	5.8	9.2	6.6	6.6	6.9	
Generation technologies (more than one may apply)							
Reciprocating engine generators	9.3	4.9	8.3	5.9	5.9	5.3	
Solar panels	18.1	12.1	16.5	13.4	13.4	13.4	
Other generation technology	26.0	15.0	19.8	20.4	20.4	18.5	

Relative standard errors (RSEs) for Table C23. Total natural gas consumption and expenditures, 2018

	RSEs for all buildings using natural gas			RSEs for natural gas consumption		RSEs for natural gas expenditures	
	Number of buildings	Total floorspace	Mean floorspace per building	Total	Total	Total	
All buildings	4.8	3.4	3.2	3.7	3.7	3.5	
Food preparation or serving areas in non-food service buildings (more than one may apply)							
Snack bar, concession stand, or coffee shop	11.4	7.1	11.6	8.9	8.9	8.2	
Fast food or small restaurant	10.6	5.9	10.7	8.8	8.8	7.3	
Cafeteria or large restaurant	9.5	5.0	8.5	7.5	7.5	6.4	
Commercial kitchen or food preparation area	9.4	4.6	8.3	5.6	5.6	5.4	
Small kitchen area	8.2	5.4	6.6	7.2	7.2	6.2	
Annual consumption (hundred cubic feet)							
1,000 or less	8.4	8.9	5.8	9.3	9.3	9.2	
1,001 to 5,000	7.0	6.1	5.3	7.2	7.2	7.3	
5,001 to 10,000	9.1	6.8	4.7	8.8	8.8	8.8	
10,001 to 25,000	6.0	5.3	3.6	5.8	5.8	5.7	
25,001 to 50,000	7.2	6.4	4.3	7.2	7.2	7.3	
50,001 to 100,000	6.8	6.1	4.3	6.7	6.7	6.9	
Over 100,000	6.9	7.6	6.1	7.8	7.8	7.9	

Data source: U.S. Energy Information Administration, Forms EIA-871A and C 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>.

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

^bOther sources includes wood, coal, solar, and all other energy sources.