

Commercial Buildings Energy Consumption and Expenditures 1992 Preliminary Estimates

Preliminary estimates indicate that in 1992 the total site consumption (the amount of energy delivered) of natural gas, electricity, fuel oil, and district heat for approximately 4.8 million commercial buildings was 5.8 quadrillion Btu. However, the total primary consumption (site consumption plus the conversion losses in the electricity generation process at the utility plant) was approximately 11.1 quadrillion Btu. (For a discussion of energy conversion factors for electricity, see Appendix A of this publication.)

- Natural gas accounted for approximately 43 percent of site consumption and 22 percent of primary consumption.
- Electricity accounted for approximately 45 percent of site consumption and 71 percent of primary consumption.
- Fuel oil accounted for approximately 5 percent of site consumption and 2 percent of primary consumption.
- District heat accounted for approximately 7 percent of site consumption and 4 percent of primary consumption.

Energy consumption patterns varied by geographic location, reflecting differences in climate, construction patterns, and energy source preferences (Figure 1). Various other building characteristics also affected energy consumption in 1992 (Table 1).

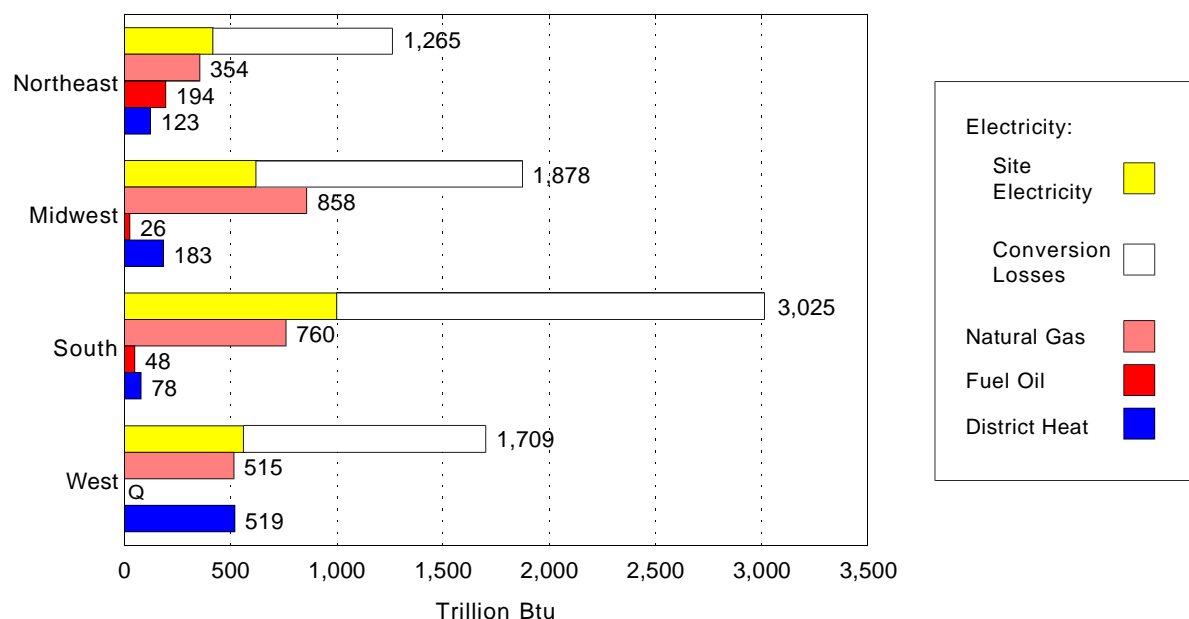
These preliminary estimates are based on data from the 1992 Commercial Buildings Energy Consumption Survey

(CBECS). The CBECS, which the Energy Information Administration (EIA) conducts every 3 years, provides data on energy consumption and expenditures for U.S. commercial buildings and on the energy-related characteristics of those buildings. Data are collected through personal interviews with building managers, tenants, or owners and through a mail survey of the energy suppliers to the buildings. The 1992 survey collected data for the first time on whether the buildings were part of any demand-side management program or had energy managers; whether the buildings had such energy-related equipment as water heaters and computers; and whether the buildings had computer rooms, rooms with special ventilation, or other space functions that would affect energy consumption.

The final estimates of energy consumption and expenditures in 1992 commercial buildings will be published in EIA's *Commercial Buildings Energy Consumption and Expenditures 1992*. This report will also provide detailed estimates of site and primary energy consumption.

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Figure 1. Commercial Buildings Consumption of Major Energy Sources by Region, 1992



Source: Energy Information Administration, Forms EIA-871A through F, 1992 Commercial Buildings Energy Consumption Survey.

Table 1. Total Site Energy Consumption and Expenditures, Preliminary Estimates, 1992

Building Characteristics	Commercial Buildings		Site Consumption		Expenditures	
	Number of Buildings (thousand)	Floorspace (million square feet)	Total (trillion Btu)	Per Square Foot (trillion Btu)	Total (million dollars)	Per Square Foot (dollars)
All Buildings	4,806	67,876	5,803	86	72,599	1.07
Building Floorspace (square feet)						
1,001 to 5,000	2,681	7,327	715	98	10,604	1.45
5,001 to 10,000	975	7,199	682	95	8,481	1.18
10,001 to 25,000	647	10,375	1,038	100	10,373	1.00
25,001 to 50,000	280	10,069	794	79	9,864	0.98
50,001 to 100,000	116	8,062	642	80	8,483	1.05
100,001 to 200,000	71	9,678	640	66	8,413	0.87
200,001 to 500,000	26	7,889	711	90	8,457	1.07
Over 500,000	9	7,278	581	80	7,924	1.09
Principal Building Activity						
Education	301	8,470	637	75	7,389	0.87
Food Sales	130	757	137	182	2,389	3.16
Food Service	260	1,491	447	299	4,811	3.23
Health Care	63	1,763	403	229	3,733	2.12
Lodging	154	2,891	463	160	5,459	1.89
Mercantile and Service	1,272	12,402	892	72	12,907	1.04
Office	749	12,319	1,272	103	18,125	1.47
Parking Garage	24	1,652	52	31	811	0.49
Public Assembly	278	4,556	310	68	4,163	0.91
Public Order and Safety	60	820	91	111	998	1.22
Religious Worship	366	3,747	109	29	1,299	0.35
Warehouse and Storage	761	11,484	590	51	6,750	0.59
Other	69	1,130	270	239	2,178	1.93
Vacant	319	4,396	131	30	1,585	0.36
Year Constructed						
1899 or Before	169	1,721	118	69	1,447	0.84
1900 to 1919	255	3,608	213	59	2,516	0.70
1920 to 1945	724	8,712	878	101	8,244	0.95
1946 to 1959	880	10,421	825	79	9,820	0.94
1960 to 1969	783	12,612	1,200	95	14,576	1.16
1970 to 1979	982	14,014	1,261	90	16,459	1.17
1980 to 1989	884	14,287	1,133	79	16,834	1.18
1990 to 1992	128	2,502	173	69	2,702	1.08
Census Region and Division						
Northeast	771	13,400	1,090	81	16,226	1.21
New England	186	3,265	299	92	4,063	1.24
Middle Atlantic	585	10,135	791	78	12,163	1.20
Midwest	1,202	17,280	1,688	98	17,204	1.00
East North Central	749	10,712	1,034	97	11,063	1.03
West North Central	453	6,568	654	100	6,140	0.93
South	1,963	24,577	1,888	77	22,843	0.93
South Atlantic	755	10,586	775	73	10,893	1.03
East South Central	454	5,375	472	88	4,728	0.88
West South Central	754	8,616	641	74	7,222	0.84
West	870	12,619	1,137	90	16,326	1.29
Mountain	297	3,645	487	134	4,902	1.35
Pacific	574	8,974	651	73	11,424	1.27
Climate Zone: 45-Year Average						
Fewer than 2,000 Cooling Degree-Days (CDD) and More than 7,000 Heating Degree-Days (HDD)	399	5,623	689	123	5,516	0.98
5,500 to 7,000 HDD	1,134	18,024	1,679	93	19,586	1.09
4,000 to 5,499 HDD	1,077	16,162	1,275	79	16,998	1.05
Fewer than 4,000 HDD	1,101	15,251	1,241	81	17,400	1.14
More than 2,000 CDD and Fewer than 4,000 HDD	1,095	12,816	919	72	13,098	1.02
Energy End Uses (more than one may apply)						
Heated Buildings	4,178	61,996	5,677	92	70,156	1.13
Air-Conditioned Buildings	3,502	57,041	5,345	94	67,207	1.18
Buildings with Water Heating	3,502	58,479	5,571	95	68,704	1.17
Buildings with Cooking	734	23,065	2,546	110	31,370	1.36
Buildings with Manufacturing	121	3,174	356	112	3,736	1.18

Table 1. Total Site Energy Consumption and Expenditures, Preliminary Estimates, 1992 (Continued)

Building Characteristics	Commercial Buildings		Site Consumption		Expenditures	
	Number of Buildings (thousand)	Floorspace (million square feet)	Total (trillion Btu)	Per Square Foot (trillion Btu)	Total (million dollars)	Per Square Foot (dollars)
Percent of Floorspace Heated						
Not Heated	628	5,880	126	21	2,442	0.42
1 to 50	713	11,525	467	41	7,115	0.62
51 to 99	618	10,211	885	87	12,165	1.19
100	2,846	40,260	4,325	107	50,876	1.26
Percent of Floorspace Cooled						
Not Cooled	1,304	10,835	457	42	5,391	0.50
1 to 50	1,176	21,715	1,648	76	16,382	0.75
51 to 99	658	13,872	1,432	103	19,454	1.40
100	1,668	21,454	2,265	106	31,372	1.46
Heating Equipment (more than one may apply)						
Heat Pumps	449	8,269	704	85	10,355	1.25
Furnaces	1,692	16,909	1,446	86	16,440	0.97
Individual Space Heaters	1,464	22,380	1,786	80	22,391	1.00
District Heat	93	5,225	829	159	9,008	1.72
Boilers	624	20,664	2,215	107	23,474	1.14
Packaged Heating Units ^a	870	16,000	1,369	86	20,070	1.25
Other	42	903	171	190	2,049	2.27
Cooling Equipment (more than one may apply)						
Residential-Type Central Air-Conditioners	816	9,021	898	100	9,791	1.09
Heat Pumps	454	8,406	753	90	10,729	1.28
Individual Air-Conditioners	1,023	17,979	1,479	82	17,725	0.99
District Chilled Water	28	2,066	309	150	3,220	1.56
Central Chillers	142	12,991	1,482	114	18,581	1.43
Packaged Air-Conditioning Units ^a	1,459	27,830	2,801	101	35,686	1.28
Swamp Coolers ^b	179	2,085	240	115	2,887	1.38
Other	8	268	17	63	249	0.93
Water-Heating Equipment (both may apply)						
Centralized System	1,994	31,599	3,349	106	39,699	1.26
Distributed System	1,557	29,502	2,454	83	31,957	1.08
Weekly Operating Hours						
39 or Fewer	1,039	8,246	278	34	3,233	0.39
40 to 48	1,278	14,998	1,011	67	13,455	0.90
49 to 60	1,004	14,046	960	68	12,701	0.90
61 to 84	645	12,062	962	80	13,532	1.12
85 to 167	478	8,467	1,126	133	12,780	1.51
Open Continuously	362	10,057	1,467	146	16,896	1.68
Ownership and Occupancy						
Nongovernment Owned	4,206	52,752	4,370	83	56,855	1.08
Owner Occupied	3,192	38,403	3,502	91	44,199	1.15
Nonowner Occupied	817	12,273	832	68	12,156	0.99
Unoccupied	197	2,077	36	17	500	0.24
Government Owned	599	15,124	1,432	95	15,743	1.04
Predominant Exterior Wall Material						
Masonry	3,115	48,585	4,139	85	51,688	1.06
Siding or Shingles	764	3,873	389	100	4,492	1.16
Metal Panels	745	7,392	568	77	5,861	0.79
Concrete Panels	87	4,961	408	82	5,841	1.18
Window Glass	46	2,028	195	96	3,347	1.65
Other	47	1,037	105	101	1,370	1.32
Predominant Roof Material						
Built-Up	1,642	30,257	2,779	92	34,978	1.16
Shingles (Not Wood)	1,381	10,570	861	81	10,299	0.97
Metal Surfacing	1,037	9,019	550	61	6,427	0.71
Synthetic or Rubber	386	11,702	1,165	100	14,644	1.25
Other	359	6,328	448	71	6,251	0.99
Percent Window Glass						
25 or Less	4,193	51,356	4,204	82	50,642	0.99
26 to 50	490	11,815	1,126	95	14,770	1.25
51 to 75	94	3,206	312	97	4,580	1.43
76 to 100	29	1,499	161	107	2,606	1.74

^aPackaged units are built and assembled at a factory and installed as self-contained units.

^bSwamp coolers (evaporative coolers) remove heat by evaporating water.

Table 1. Total Site Energy Consumption and Expenditures, Preliminary Estimates, 1992 (Continued)

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	Number of Buildings (thousand)	Floorspace (million square feet)	Total (trillion Btu)	Per Square Foot (trillion Btu)	Total (million dollars)	Per Square Foot (dollars)
Energy-Related Space Functions (more than one may apply)						
Commercial Food Preparation.....	735	22,166	2,504	113	30,774	1.39
Computer Room.....	223	14,199	1,539	108	20,434	1.44
Rooms with Special Ventilation.....	236	8,042	1,034	129	11,678	1.45
Activities Using Large Amounts of Hot Water.....	203	6,862	964	140	10,083	1.47
Energy Conservation Features (more than one may apply)						
Any Conservation Feature.....	4,357	64,403	5,723	89	71,498	1.11
Building Shell.....	4,223	62,056	5,533	89	69,605	1.12
Heating, Ventilation, and Air-Conditioning.....	2,604	50,281	4,884	97	61,211	1.22
Lighting.....	1,178	29,453	2,960	101	37,883	1.29
Other.....	264	5,952	565	95	6,965	1.17
Energy Management Practices (more than one may apply)						
Energy Management and Control System.....	236	14,320	1,571	110	19,830	1.38
Demand-Side Management Participation.....	315	11,310	1,327	117	15,493	1.37
Energy Audit.....	521	14,779	1,479	100	19,319	1.31
Building Energy Manager.....	49	2,311	297	128	3,156	1.37

Source: Energy Information Administration, Forms EIA-871A through F, 1992 Commercial Buildings Energy Consumption Survey.